LOCAL MANAGEMENT OF NATURAL RESOURCES IN SOUTHERN BURKINA FASO

Christopher Nigel Howworth

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Abstract

This thesis examines land use change and natural resource management in the province of Sissili in southern Burkina Faso, an area than saw widespread immigration caused by Sahelian droughts that began in the 1960s. This immigration caused concern amongst development professionals about the future of the economic and environmental sustainability of the province. However, over a period of two years of close contact with the farming communities, adaptive and innovative actions were noted as people developed new resource use patterns to safeguard both environment and livelihood. This study examines various aspects of the production and livelihood systems of indigenous and immigrant ethnic groups and shows that:

- The purpose of the emerging new resource use arrangements is to guarantee subsistence for all;
- Negotiation between ethnic groups and communities is the mechanism that guarantees subsistence;
- Landscapes (lifescapes) are not static but are created through assimilation of information and different farming systems;
- The objective of local production systems is to maximise livelihood subsistence and to minimise negative environmental impacts which threaten long term sustainability;
- The resource use system needs to be understood in both a historical and a local context, with specific reference to the economy of affection.

These conclusions were drawn from the study of three village case studies in Sissili, using detailed ethnographic and participatory research methods. The theoretical and practical angle of this study is that farmers manage their local resources to maximise livelihood opportunities, altering landscapes to suit their own purposes.

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LIST OF ACRONYMS

Acronym	Description
ADESSI	l'Association pour le Développement Economique et Social de la Sissili
CGTV	Cellule de la Gestion de Terroirs Villageois
CIDR	le Centre International pour le Développement Rurale
CNR	Conseil Nationale de la Révolution
CRPA	Centre Regional de la Production Agricole
DRET	Direction Regional de l'Environnement et du Tourisme
DVA	Direction de la Vulagarization Agricole
FCFA	Francs de Communauté Financiére d'Afrique
FED	Fonds Européen de Développement
FSR/E	Farming Systems Research and Extension
IBS	INYPSA/BDPA-SCETAGRI/SOPEX
IMF	International Monetary Fund
INSD	Institut National de la Statistique et de la Démographie
LWR	Lutheran World Relief
NGO	Non Governmental Organisation
NTFP	Non Timber Forest Products
PAF	Programme Agroforestier
PDCS	Projet de Développement Communautaire de la Sissili
PDIPF	Programme de Développement Integré pour le Promotion des Femmes dans la Province de la Sissili
PRA	Participatory Rural Appraisal
R&D	Research and Development
RRA	Rapid Rural Appraisal
SOFITEX	Société des Fibres et des Textiles
SPA	Service Provincial de l'Agriculture
SPE	Service Provincial de l'Elevage
SPET	Service Provinical de l'Environnement et du Tourisme
SSI	Semi-Structured Interviews
UNAIS	United Nations Association for International Service
UNDP	United Nations Development Programme
UNICEF	United Nations Childrens Fund
UNSO	United Nations Sahelian Office

CONTENTS

CHAPTER 6. VILLAGE CASE STUDY TWO: BOUTIOUROU

CHAPTER 7. VILLAGE CASE STUDY THREE: SABOUE

CHAPTER 8. COMPARING DIFFERENCES

A list of the figures

A list of the tables

A list of the text boxes

1. INTERACTING PEASANTRIES

Chapter overview

This chapter both introduces the thesis and provides the overall context for the study of changing peasant production patterns in southern Burkina Faso. After the introduction (1.1) which maps the evolution in recent Third World development thinking, Burkina Faso and its geography, population, history and economy is presented (1.2). Burkina Faso is then located in the larger context of the Sahel (1.3) and there follows (1.4) an historical examination of West Africa and its population. The central theory to the study, an interpretation of the peasant mode of production, is then presented and the idea of the lifescape is introduced in 1.5.

1.1 Introduction

This thesis explores the idea that the peasant mode of production[1] has shown itself to be efficient in providing subsistence to the household and ensuring family survival. It is also argued that development can occur within the peasant mode of production, as it has always done. Historically, the peasantry of Africa have been highly mobile and highly adaptive in creating lifescapes which are mobile in both time and place and it is these which make the peasant mode of production so effective. The resilience of the peasantry is due to its proved ability to survive and prosper over millennia. Far from being an outdated mode of production, it is constantly modernising itself, assimilating what global developments offer, to make it a more effective system.

As African landscapes continue to be studied in detail, new findings emphasise the creative and productive human influence, rather than the negative impacts of humans. As Tiffen et al (1994) showed in part of Kenya, more people meant less erosion: Fairhead and Leach

[1] A mode of production is an abstraction identifying the basic logic and structures of given social formations (Hyden, 1980:12).

(1996) showed that local people were the reason behind the increasing presence of forests in parts of Guinea. This study attempts to show that the presence of three times as many people in one area, compared to fifteen years ago, contributes to a vibrant economy and a productively managed environment. It is essentially a study of locality.

To understand how people manage their local landscapes, it is important to understand the rationale and driving forces behind the peasant mode of production in a historical context.

1.2 Burkina Faso

1.2.1 Physical Geography

Burkina Faso is a land locked country in the West African Sahel region, north of Ghana, between the Sahara desert and the Gulf of Guinea, south of the loop of the Niger River. It is located on a plateau that rises gently from an elevation of 800 feet in the southwest to 1150 feet in the northeast (Atampugré, 1994: 4). It covers 274,200 square kilometres and shares borders with Mali, Côte D'Ivoire, Niger, Ghana, Benin and Togo (figure 1.1). The country has generally poor soil with many areas being infertile semi-desert. The climate is hot and dry, with average annual rainfall 650-1150 mm but less than 250 mm in the north. Water is therefore scarce in many parts of the country and, where it is available (for example, in the Black Volta River valley), infestations of river blindness or sleeping sickness prevent its use for agriculture. There are three distinct seasons: warm and dry from November to March; hot and dry, from March to May; and hot and wet, from June to October.

1.2.2 Population

Burkina Faso is also one of the more densely populated countries in the Sahel with an estimated population of just over 10 million, three quarters of whom live in the rural areas. The Mossi plateau, in the centre of the country, has the highest population density of 32.5 people per square kilometre and accounts for almost half the country's population (Atampugre, 1994:4). Burkina Faso has a very young population with some 47 percent being under five years old. There are three major urban areas; Ouagadougou, the capital (population 500,000), Bobo-Dioulasso (population 250,000) and Koudougou (population 75,000). The urban population has been estimated to be growing at 5.4 percent per annum since 1980 (EIU, 1991-92). Burkina Faso's population is not well provided for in basic

services like education or health. Adult literacy rate is very poor, running at only 16 percent, with only 7 percent of women being literate. There is only one doctor for every 54,000 people and one nurse for every 3,000.

Burkina Faso is home to 60 different ethnic groups which belong to two major West African cultural groups - the Voltaic and the Mand. Burkina Faso is dominated by the Voltaic group which include the Mossi who make up 52 percent of the population. The Mossi were originally a warrior tribe that migrated from Ghana to present day Burkina Faso and established an empire that lasted more than 500 years, from 1400 AD to 1900 AD. They still retain allegiance to their king, the Moro Naba, who holds court in Ouagadougou. The other major ethnic groups include the Fulani, Bobo, Gourounsi, Bisa-Samo, Gourmantché and Senefou. Ethnic groups that were previously Animist have mostly been converted to Islam although many of these still retain many of their old animist traditions. About ten percent of the population follow Christian religions. French is the official language and most of the plethora of tribal languages belong to the Sudanic family, which is spoken by 90 percent of the population.

1.2.3 History and Politics

The area now occupied by Burkina Faso was one of the oldest kingdoms in West Africa, dating back to the eleventh century. In 1400, the Mossi ethnic group came from what is now Ghana to settle in the area. They created 19 separate kingdoms each depending on the most powerful central kingdom of Wogodogo, today's Ouagadougou (New Internationalist, 1995). By 1600, the Mossi created what was effectively a centralised state with a strong administrative system that resisted conquest by neighbouring African empires. It was colonised by France in 1896 and was used as a labour pool by the French to service the coastal colonies. It gained independence in 1960 as Upper Volta. After a succession of corrupt and unsuccessful governments, a group of army officers led by Thomas Sankara seized power in 1983. Sankara formed the socialist *Conseil Nationale de la Révolution* (National Revolutionary Council - CNR) which attempted to develop a self-sufficient economy.

Figure 1.1. Burkina Faso

source: internet site - http://www.lib.utexas.edu

In 1987, tensions surfaced between Sankara and Captain Blaise Campaoré, his erstwhile partner, who represented the relatively privileged government employees and trade unions (UNAIS, 1996). The tensions resulted in Sankara's assassination in October 1987. The basic needs strategy of Sankara was abandoned and the IMF was invited in.

In 1991, there was a significant political change which saw a referendum on a new constitution. The June referendum in the same year gave a 93 percent vote in favour of multi-party democracy. A new constitution has now been adopted and there are now well over 20 new political parties. In November of 1991, Blaise Campaoré was elected unopposed for a second term. Table 1.1 provides the most recent detailed base data for the country.

1.2.4 Economy

Burkina Faso has a very weak national economy and has an external debt of US $116,173 million (World Development Report, 1992). Agriculture provides about 40 percent of GDP and is mainly of a subsistence nature or is traded in the informal local economy. Cash crops include cotton, ground nuts, sesame and shea nuts. The main food crops are cereals such as sorghum and millet but livestock raising is also important, especially for the nomadic ethnic groups. Formal industry, dominated by unprofitable government controlled corporations, accounts for about 15 percent of the GDP and employs four percent of the population. However, this four percent of the population consume almost 50 percent of the budget through their salaries. It was projected by the political West African journal, *Jeune Afrique*, that 1993 salaries would reach 64 percent of current expenditure and 70 percent of national income (Jeune Afrique, 1993).

Burkina Faso's industries include mining, agricultural processing plants, brewing and bottling, light industry and trade. The informal sector has become an increasingly important source of income for many Burkinabé people, particularly with the growth of the urban areas (UNAIS, 1996). The country holds limited natural resources which have been underexploited due to poor infrastructure. These resources include manganese, gold, limestone, marble, phosphate and zinc. Economic development is hindered by a poor communications network within a landlocked country.

Table 1.1 Base data for Burkina Faso

	Unit	Period	Figures
AREA/POPULATION			
Area	Thousand km2	1985	274
Total population	Thousands	1985	7936
Population density	Persons/km2	1985	29
Life expectancy	Years	1985	48
Infant mortality	-/1000	1985	152/1000
AGRICULTURAL PRODUCTION			
Groundnuts	Tonne	1987-88	379
Cotton seed	Tonne	1987-88	148,015
Cotton fibre	Tonne	1987-88	58,464
Shea nut	Tonne	1987-88	1,825
Sesame	Tonne	1987-88	625
Maize	Tonne	1987-88	176
Millet and sorghum	Tonne	1987-88	2,239
ENERGY			
Electricity production	Million kwh	1989	148.1
Consumed petroleum prods:			
petrol, kerosene, diesel;	Thousand m3	1989	146.4
fuel oil, diesel oil	Thousand tonnes	1989	56.3
TRANSPORT AND COMMUNICATIONS.			
Rail transport:			
Total merchandise	Thousand tonnes	1987	428
Aeroplane passengers:			
leaving;	Number	1989	63,951
arriving	Number	1989	63,625
Aeroplane freight:			
leaving;	Tonne	1989	4,556
arriving	Tonne	1989	3,912
COMMERCE			
Value of imports	Billion FCFA	1989	175.3
Value of exports	Billion FCFA	1989	30.2
Value of principal imports:			
food products;	Billion FCFA	1989	29.3
energy products;	Billion FCFA	1989	10.8
raw materials;	Billion FCFA	1989	2.7
machines/transport vehicles;	Billion FCFA	1989	82.8
other industrial products;	Billion FCFA	1989	-
Value of principal exports:			
food products;	Billion FCFA	1989	3
raw materials	Billion FCFA	1989	17
WAGES AND PRICES			
Variation in price indices	percent	1990	-0.83
Minimum wage	FCFA/hour	1988	130.69
FINANCE			
National budget	Billion FCFA	1990	159.5
Budget previsions:			
Total resources	Billion FCFA	1990	98.5
Total spending	Billion FCFA	1990	111.1
Foreign debt	Billion FCFA	1988	241.7
Balance of payments	Billion FCFA	1987	16.6
NATIONAL ACCOUNTS			
Gross Domestic Product at market prices	Billion FCFA	1985	455.9
General Purchasing Power at factor cost	FCFA	1985	57,447

Source: INSD, 1993.

1.3 Burkina Faso and the Sahel

The Sahelian landscape is mostly flat or gently undulating at altitudes below 600m. There are three main rivers running through the Sahel; the Niger, Senegal and Nile, which hold

water that originates from outside the region and carry it into the dry interior and out again. These rivers support a wide range of agricultural practices and indigenous vegetation. The vegetation of the Sahel consists of annual grass and scattered bush steppe in the north, gradually merging into Sudanian savannas with perennial grasses, scattered trees, and extensive rain-fed cultivation in the south (White, 1983). The ecology of the Sahel is strongly seasonal and virtually all of the vegetation depends on the rains with most woody species being deciduous. The herbaceous layer is predominantly made up of annuals and the perennials die back to the ground each dry season. In the northern regions, the grasses and herbs are green for only about one month and this increases to three months in the south. Evapotranspiration in the Sahel is extremely high and the potential evapotranspiration runs at approximately 2,000 mm per annum (White, 1983).

In the past, the Sahel has been predominantly a pastoral zone with nomadic and transhumant herding in the north and more settled agro-pastoralism and agriculture in the south. However, the population of the Sahel has more than doubled in the last 40 years and sedentary agriculture has moved into much of the central Sahel that was previously regarded by colonial administrations as being unsuitable for settled agriculture. Thus much of the landscape of the southern and more favourable mid-Sahel consists of fields and extensive areas of fallow bushland in various stages of regrowth.

Because of the climatic uncertainty of the Sahel and the recent history of droughts, agriculture in the region has experienced failure of harvest and famine conditions. In these times of crisis, the global community has provided humanitarian and relief measures. In 1973, after one of the worst droughts in modern human history, US $7.45 billion in aid was committed to the Sahelian countries (Twose, 1985:1). This aid was aimed at improving food security and increasing agricultural production. Ten years later, another drought of a similar scale affected the Sahel and the FAO appealed for millions of tonnes in food aid to help the starving. Clearly the earlier investment failed.

1.4 History, environment and movement in West Africa

"*The use of land and vegetation is degrading...this is indeed a root assumption in western cosmology*" (Collingwood, 1940, quoted in Fairhead and Leach, 1996:13)

Current land-use practices and environmental arrangements in West Africa reflect a long and complex history and it is therefore necessary to examine historical perceptions about how African communities used and adapted themselves to the prevailing environmental conditions. Western experts and colonial administrators before them, have considered the African farmer as a despoiler of environment; far from being a custodian, the farmer is a destroyer of the very resources that sustain him. As Collingwood says, this is a root assumption in western thought. It follows that the more people there are, the more damage they will do: hence, western fears of population growth. Fears are intensified when these large populations start to move and migrate and images spring to mind of a swathe of forest ants clearing away all vegetation that lies in their path. It is necessary to examine our own perceptions of Africans and environmental degradation because it is these, more than anything else, that have led to 'Africa in crisis' conclusions.

According to Giblin *et al* (1996:2), there have been two great debates by historians over environment and demographic growth: firstly has been the 'Merrie Africa' approach, which sees stable pre-colonial communities as having lived in harmony with nature before suffering depopulation, ecological disaster and economic exploitation under colonial rule; and there is the 'Primitive Africa' approach which depicts precolonial Africans as having inhabited a hostile environment in perilous proximity to famine, epidemic and demographic reversals before achieving greater security in the colonial period. The 'Merrie Africa' led to the assumption of a stable social system and economic organisation as well as permanent ecological equilibrium and the 'Primitive Africa' illustrated the perpetual darkness and hopelessness of Africa unless it be saved through conversion, conquest and foreign rule (Sutton, 1990:2). Aside from these perceptions being vast distortions on reality[2], both negate the capacity and capability of Africans to transform prevailing external (and internal) conditions to suit their own purposes. In this sense, western perceptions of the African situation imply stasis, i.e. there was a before and after, a then and now, and 'dynamism' was replaced in the vocabulary by 'development'.

Environments, economic and political situations, cultures (through invasion and religious contact) and climate have constantly changed throughout African history and what is seen today is the result of thousands of years of complex history. Communities have continually used their economic, political, cultural and moral resources to prosper in ever-changing

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[2] Sutton (1990) calls this antiquarianism, a sentimental quest for the past which denies history and with it an understanding of change and development and the pressures stimulating them.

ecological circumstances (Giblin *et al*, 1996:3). Unfortunately, the historical dynamism that should be used to locate African development is ignored. Instead, present socio-economic and ecological conditions are assumed to be relics of a by-gone era which may have been slightly changed by colonial intervention. It is upon these assumptions that development projections are based. Sutton (1990) says that there persists the notion of an essentially unchanging, a supposedly 'traditional' African past, the details of which need little researching since they can readily be assumed. Once we begin to think about farming and pastoral societies inhabiting ever-changing environments, we are led to consider how economic institutions, political and gender relations, intellectual leadership and moral imperatives may have been involved in the process of environmental adaptation. (Giblin *et al*, 1996). It is for precisely this reason that the recent process of north to south migration in the province of Sissili in Burkina Faso needs to be contextualised.

West Africa is one of the most sparsely populated regions in the world and historians of all persuasions are united in attributing its underdevelopment in part to a low density of population, which has inhibited growth of the economy, state formation and intensification of agriculture (Hart, 1982:133). The aspects of historical blindness, the assumption of stasis and the myth of over-population cloud modern interpretations of a very dynamic region. In such a clouded interpretation, there is a limited view of Africa and, it is categorised, sadly and unfairly, as an irrelevant corner of the globe (Sutton, 1990:3).

In the following section we examine the internal dynamics of African communities in an attempt to describe and explain their modes of production in a wider context.

1.5 The peasant mode of production

1.5.1 The peasantry

The 'peasantry' have been studied intensely in academic and political history since the 1850s, most notably by Karl Marx in 'Peasantry as a class' in 1850 and Chayanov in the early 1900s with the 'Theory of peasant economy'. More recently the study of the peasantry has been popularised by Scott (1976), Hyden (1983), Richards (1985) and most recently Chambers (1983, 1989, 1994, 1997). It is necessary in this study, not to provide a commentary of the past and present debate on theories of peasantries, but to illustrate what

is meant by peasantry in this particular context. Shanin (1975:240) provides a useful introduction:

> "*The peasantry consist of small agricultural producers who, with the help of simple equipment and the labour of their families, produce mainly for their own consumption and for the fulfilment of obligations to the holders of political and economic power*".

For the peasantry, for want of a better word, the family farm is the basic unit of ownership, production, consumption and social life and the individual, the family and the farm appear as an indivisible whole (Shanin, 1975). The family's objective is survival through subsistence and consequently their economies have been little understood through neo-classical economic study which is focused on markets. What is unique about the peasantry is that the unit of consumption is also the unit of production. The family begins with a more or less irreducible subsistence consumer demand, based on its size, which it must meet in order to continue as a unit (Scott, 1976:13). The subsistence ethic, coupled with the family as the producing and consuming unit, makes the peasant's motivations both unique and universal at the same time. This universality of family solidarity coupled with an existence in a natural economy, or biomass economy (O'Keefe *et al*, 1982), makes for the segmentation of peasant society into small units with a remarkable degree of self-sufficiency and ability to withstand crises (Shanin, 1975:245). Vierich (1986) agrees saying that the organisation of peasant societies into smaller units (or compounds) also provided more vulnerable units with a form of buffer against misfortune.

The studies of the Russian peasantry of the late 1800s have been found to be very similar to contemporary African peasantries, with southern Burkina Faso being no exception. For example, Shanin (1975:244) notes that the family of the Russian peasant at the beginning of the twentieth century was generally 'the people who eat from the same pot'. This is common throughout Africa and the Third World, with the Mandikas in the Gambia using the name **sinkiro** (Howorth, 1992) to mean the same thing and similarly a Malayo-Polynesian ethnic group using the term **mweenga** (Goodenough, 1955). Likewise, Fei (1953:32) in his study of Chinese peasantry, says that "the peasantry ... is a way of living". There are universals in peasant modes of production.

One of these fundamental universals in peasant economies is their relationship to land. Moyo (1995) stresses that land fulfils different roles in peasant economies which apply along the spectrum of peasantries throughout the world. Moyo notes:

- land as a store house of nature for reproduction of future generations;
- land as an agricultural production tool for subsistence food and exchange incomes to meet broader subsistence needs and for re-investment;
- land as a receptacle of direct household utility needs; water, woodfuel, organic fertiliser, medicine, shade, fruit, housing and home and meat.;
- land as social and political territory of governance and community reproduction.

Land is central to the peasant economy and attempts at severing the indivisible links that attach human to land has come up against fierce resistance, as noted by Scott (1976) in Southeast Asia.

To return to the household economy of the peasant, the family unit is crucial to understanding the processes and dynamics of the family's production system[3]. As Galeski (1963:140) notes, "the family is the production-team of the farm and position in the family determines duties on the farm, functions and rights attached. The rhythm of the farm defines the rhythm of family life." Shanin (1975:246) increases the depth of analysis to say that the individual in his own right 'doesn't count' because the key to peasant economies is the family and the survival of the family. The individual becomes almost unimportant but at the same time he/she is vital. Like Hyden's (1986) analysis where he says that although villagers normally have an astonishing ability to ensure everyone's livelihoods, the absence of a key household member can have adverse effects on other family members.

> "*Not every member of the household does everything. Husbands and wives combine to carry out most tasks falling within the sphere of the household economy; children are drawn in to care for crops, animals and smaller children, and combinations of relatives or neighbours help each other with farming, construction or other heavy jobs*" (Hyden, 1986:18).

The impact of male seasonal migration on households, for example, can be severe. This integration of the individual and the family unit being 'more than the sum of its parts' is

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[3] In several African languages, the common word for 'poor' implies a lack of kin or friends (Von Braun, 1991:409).

contrasted to capitalist economies where the individual becomes the basic nuclear unit of society, free to interact with any others in the huge new complex of social hierarchies and structures (Shanin, 1975). From this premise alone, it is difficult to understand peasant economies from a capitalist vista.

The peasant economy operates a risk minimisation approach to subsistence. In this approach the peasant (farmer) prefers to minimise the probability of having a disaster rather than maximising his average return (Scott, 1976). Thus, the profit and accumulation motives rarely appear in their pure form, which makes the neat conceptual models of maximisation of income, normal in a market economy, of doubtful applicability to a peasant economy (Shanin, 1975). Another reason why capitalist modes of thought do not 'connect' with peasant economies is raised by Clifton and Wharton (1971:570) who note that the peasant's consumption is fairly constant; in good years the farmer may have some surplus to sell, and in bad years little or none, but at least his family is fed. They also calculated that the peasant family consumes 80 percent of its produce and say that such a consumption level can be regarded as his minimum subsistence level, i.e. a level he will strive not to fall below. Scott (1976) calls this the 'safety-first' maxim and says it is a logical consequence of the ecological dependence of peasant livelihoods and it embodies a relative preference for subsistence security over high average income. This characteristic of peasant communities finds expression in a wide array of actual choices, institutions and values.

Clifton and Wharton (1971:566) identified three characteristics of peasant communities:

1. they are historically proven to be successful, i.e. the members have survived;
2. they are relatively static (but the general pace of development is below that which is considered desirable by modern economies); and,
3. attempts at change are frequently resisted, both because the known institutions and processes have proven dependable and because the known elements constitute something akin to an ecological unity in the human realm.

This resistance to change was seen by Scott (1976), who identified the similarities between the peasantry of eighteenth and nineteenth century Europe with that of contemporary Asia. He comments that the South East Asian protest movements were less about equality of wealth and landholding but more about the 'right to subsistence'. This is the same 'right to subsistence' that the peasantry hold as the fundamental element of peasant society and can

be seen with the settlement of Mossi and Fulani immigrants in Sissili (see later). Scott (1976) goes on to say that all village families will be guaranteed a minimal subsistence niche insofar as the resources controlled by villagers make this possible. "Village egalitarianism ... is conservative not radical, it claims that all should have a place, a living, not that all should be equal" (Scott, 1976:5). This is clear when looking at Nuni society (see chapter 4) where there is a strong belief in hierarchies; subsistence, however, is at the root of peasant society. Evans-Pritchard (1951:81) identifies this in its righteous extreme in his study of the Nuer, "no-one in a ... village starves unless all are starving". The historical patterns of resistance by the peasantry are also coupled with peasant producers enjoying an unusual degree of autonomy from other groups, such as the state, in society. Hyden (1986) says that this is partly due to the rudimentary technology that characterises most of peasant production. To illustrate this, and the subsistence level, Hart (1982:78) tells us:

> "*They build and repair their houses; they prepare food and fetch water, fuel and other domestic supplies; they spin, weave and sew clothing; they keep animals, slaughter them and tan their hides; they make tools, pots, baskets, furniture and ornaments; they generate remedies for their ills; they run their own systems of conflict resolution and work hard to keep a variety of spiritual agents appeased*".

Scott's 'moral economy' (1976) was one where subsistence was guaranteed as far as possible within village communities. "They [the informal social guarantees] represent the peasant view of decent social relations embodying the right of all to a subsistence niche and the pooling of risks ... they are standards of moral judgements" (Scott, 1976:41). However, this morality is not always apparent, "they aid [each other] because there is a tacit agreement about reciprocity and their assistance is as good as money in the bank when the situation is reversed[4]" (Scott, 1976:28). Amartya Sen (1982, 1983, and Dreze and Sen, 1989) called this arrangement (and similar arrangements) *entitlements* and looked at the loss of such arrangements as the root cause of poverty and famine. Following Sen, the entitlement to exchange, reciprocity and aid is central to peasant economies.

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[4] In a similar vein, Platteau (1991:155) has interpreted the moral economy as a 'social-security' economy and says that people belonging to these communities find collective methods to protect themselves against major contingencies and production hazards. Platteau also points out that Scott made the mistake of confusing social-security arrangements with altruistic behaviour.

Scott's interpretation of the peasant economy is different to that proffered by Hyden (1980) and his 'economy of affection[5]". Hyden's construct attempts to explain *how* and *why* peasant economies work rather than their morality (although when morality is talked about it is done so in relation to the ethics of local political economies[6]) as he says "the economy of affection has nothing to do with fond emotions per se" (Hyden, 1983:8). There are many similarities in both interpretations because they are essentially describing the same phenomena. Hyden (1986) comments that this type of economy [of affection], which springs from the needs and dynamics of micro- rather than macro-structures, becomes important in any society where the producer has not yet been cut off from his land, i.e. the rural peasantry.

Both Scott (1976) and Hyden (1986) agree that the peasantry operate within a type of economy which must be conceptualised independently from either capitalism or socialism. In most parts of the world, the economy of affection has been reduced to an historical artefact; the moral economy that Scott described in Southeast Asia has been effectively overpowered by other economic forms but this is generally not the case in Africa (Hyden, 1986). This is because of the resilience of peasants as producers coupled with a weakness of the state that cannot drive development.

> *"As long as Africa's leaders do not effectively control the means of production, they can sustain their own power and influence only by following the rules of the economy of affection. Although such measures as price incentives may have effects, the most important step is manifestation of direct support for the relevant communal realm"* (Hyden, 198625-26).

1.5.2 Peasant adaptation

The African farmer will adapt his or her farming system in response to household needs, regardless of the availability of new technologies or extension messages. Boserup (1972) was critical to the arguments of agricultural intensification in response to demographic

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[5] The economy of affection (Hyden, 1980:18) has its basis in the intimate connection between the local resources and technologies and a kin-based mode of production (Anon, 1990:7). It is an economy where all aspects of the community's livelihood (resource base, exchange system, family duties, social relations, religious/cultural activities, etc.) are internalised and carry equal relative worth. It is not a cash economy, nor is it a formal economy and, as such, has been little understood by western modes of thinking. Economic analyses of African social systems concerned with capital flows alone (and this includes classical sustainable development approaches) miss the centrality of symbolic forms of capital in everyday life: the complexities of gift-giving, duties and other practices associated with the maintenance and accumulation of prestige and status (Bourdieu 1977:173).

[6] "Rights and obligations are still defined primarily in relation to precapitalist structures associated with a system of smallholder peasant production" (Hyden, 1986:25).

change. She provided a crucial balance to Malthusian interpretations of the carrying capacity of land and the inelasticity of agricultural production. Boserup said that population, not agricultural production, is the independent variable that will dictate growth in subsistence economies.

Boserup (1972:15-16) identified five agricultural systems of increasing intensity: forest-fallow, bush-fallow, short-fallow, annual cropping and multicropping. The crucial variable in all these systems is the presence of fallow as a method of fertility management. Under low populations land can be cultivated for short periods (one or two years) while the fertility remains high, then left fallow for up to 40 years. As populations increase and the need for agricultural land increases, fallow periods will decrease because of competition for land. This does not mean that all the land in a given area will be farmed; some land in that area may be devoted to other land uses such as gathering, pasture, gardening or for future farmland. In this situation the agricultural period (i.e. frequency of cropping) is too long to simply utilise the soil's natural fertility and fallow period is not long enough to completely restore soil fertility. Thus, additional techniques need to be used, such as crop rotations, mulching and other techniques of soil fertility management. As the frequency of cropping increases (and the agricultural land available decreases) so do the inputs that the farmer must use. This may culminate in annual cropping where the land is only left uncultivated for several months or in mixed cropping where the land is continually cropped. Boserup (1972:13) comments on this process,

> *"By contrast, when the analysis is based upon the concept of frequency of cropping, there can be no temptation to regard soil fertility exclusively as a gift of nature, bestowed upon certain lands once and for all. Thus, soil fertility, instead of being treated as an exogenous or even unchangeable 'initial condition' of the analysis, takes its place as a variable, closely associated with changes in population density and related changes in agricultural methods".*

Fairhead and Leach (1996) identified in Kissidougou, in Guinea, that local communities value their soils according to how long they have been cropped, i.e. the longer they have been cultivated, the longer the process of soil fertility management and the more fertile the soils (called 'the feminisation' of the soil).

Intensification of the agricultural system has more to do with an intensive system of soil fertility management, which largely consists of reducing the natural role of fallow. This is in

contrast to increased mechanisation of the agricultural system or the increasing productivity of labour.

1.5.3 Family dynamics and the farm

In order to understand the production system, we must understand the unit of consumption, i.e. the household unit. The system of consumption organises the use of production and the modalities of production. It is not sufficient to simply talk about the 'farm family' because of its implication of a single unit composed of husbands, wives and children, although these do exist. In southern Burkina Faso, and in many parts of Africa, the household is composed of several family units from the same lineage, and each member has his or her own duties, responsibilities and obligations to ensure the social reproduction of the household.

Single family units do exist and they represent breakaway factions from a larger 'family unit' (or household) of the same lineage. These, let us call them young families, often still have links to the larger compound they have left; i.e. obligations of work, remittances or social duties, and, in return, receive support from the larger unit. It is a gradual process of gaining total independence that is linked with the growth of the young family into a mature family that has the ability to support itself in totality. Independence brings forth interdependence, in the sense that once a conjugal unit has broken away from the parental home, its survival still depends on the remittances and reciprocity of its parental source. Parallels here can be drawn in the province of Sissili, on the breakaway village of Saboué from Pissai (see chapter 7). However, unlike the young family unit whose main priority is to gain independence in material terms, i.e. food production to ensure its own social reproduction, it has taken many years for Saboué to gain its self sufficiency in spiritual and 'legal'[7] terms from Pissai. The breakaway family still relies to a large extent on the paternal home for spiritual and legal guidance.

To return to the universality of peasant modes of production[8], it is pointed out that "the head of the family appears as the manager rather than the proprietor of family land" (Thomas and Znaniecki, 1918:92). This is coupled with the observation, in 1888, by Mukhin that the family head's function has the role of the manager of the common family property. These dated observations remain true today in Africa.

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[7] Legal in this sense relates to the customary law and management arrangements.
[8] Shanin (1975:240) says that "peasantry appears to be a type without localization"; it would seem from the proceeding lines that they are 'a type without localization' in time as well as space.

In the province of Sissili, within the sedentary ethnic groups the organisation of the production unit, i.e. the family farm, is organised through and within the household. The head of the household, the most senior male member, allocates land to the smaller production units within the same household. All of these production units, including that of the household head, contribute to overall household food security and the social reproduction of the families. The household in Sissili is usually made up of more than one (from one to four) conjugal units with the most senior, i.e. oldest, of the lineage being the head. The size of the household, i.e. the number of working members, will dictate the size of the land surface that is farmed. In Sissili, the land chief will assess the individual household's need in terms of land surface area for food production. The chief will then apportion land accordingly. For example, he would not allow a single family household to have ten hectares even if sufficient labour was available.

Vierich (1986:163) in her study of peasant households in Burkina Faso correctly interprets the household leader's duties:

> "*The compound head represents the interests of the whole group in the larger field of lineage and village politics. Furthermore, he had the authority and responsibility to request land from the lineage head [i.e. the village or land chief] and to arrange, and often to finance the marriages, baptisms, funerals and group labour invitations that took place within the compound group, even when these were for the benefit of an ordinary household within the group*".

In this way, the household head has to ensure the welfare of all household members and responsibilities are great. The household head must ensure the survival of his household which means; ensuring enough food (grain) for all household members even in famine years; providing for visitors and lodgers; caring for the infirm, handicapped and aged of the household (and often those external to the household) and ensuring visiting group workers are fed or renumerated appropriately. This means that the production unit (i.e. farm) of the household head is likely to be proportionally bigger in size than those of the separate household units, whose purpose is only to provide subsistence for the respective units. In other words, the household head must strive to produce a surplus that can be used to fulfil social and political obligations as household leader. Vierich (1986) notes that compound leaders may even raise their annual cereal requirements in anticipation of a certain frequency of failure, because of illness or other misfortune, within the smaller production units sharing

their compound. This welfare system is highly sophisticated and goes a long way to guarantee subsistence to all members; like all welfare systems, there are contributions from the beneficiaries.

The household head does not have all these obligations and responsibilities without material support; there are also privileges that come with the position. Firstly, the household head has the best agricultural land and ensures its higher productivity through the labour contributions of other family members. Thus, in addition to working on their land, the conjugal units must work on the larger farm of the household head. In addition to this, the household leader, because of political and senior lineage position, can secure labour from other sub-units from other households in the community. This not only reduces labour bottlenecks but also ensures reciprocity from one household to another in times of need, such as hungry periods. The household head also has access to the resources, both monetary and physical, of the other household members in times of need. This 'commandeering' of vital resources is recognised as necessary by the household members and is not contested. In the words of the Mossi proverb, 'The snake gets whatever is in the belly of the frog' (Skinner, 1964:115).

The position of 'leader' in relation to other deferential household members is not a relationship open to abuse. If he were to abuse this position, he would lose the support of his juniors and with it, his access to extra labour, land and capital (Duval, 1985). It is an unspoken rule in households that if the leader invests in his own material wealth or physical well being then he must also do the same for the other members of the household. His wealth or development must be at a pace with the entire household and not at its expense.

This 'living under the umbrella' has certain advantages for the smaller production units within the larger household. Because they are more-or-less assured of their subsistence, they have the relative freedom to pursue other activities, often of an economic nature. These activities include wage labour, trade and craft production which may have been prohibited by the requirements of crop work. This leads to a diversification of household activities and spreads risk. Vierich (1986:163) traces the development of the position of the household head and his rationality.

> "*If one considers the special rights and obligations of the compound head, one can better understand the economic performance of the production units that they lead. The compound leaders ...were at one time simple* [family] *heads within the compounds of their elder kinsmen. With their ascent to*

compound leadership, the pressures and privileges of their position pushed, and permitted, them to invest more in agriculture and to produce at surplus intensities".

Thus, there is a linear hierarchy in peasant society in Burkina Faso that allows all to enjoy the privileges and punishments of being at any one particular stage.

1.5.4 Lifescapes

The term 'lifescape' was first introduced by Salibo Somé and Kevin McSweeney (1996) while carrying out research and development in the north of Burkina Faso. They defined it as the social, cultural and economic interactions that occur across the landscape. It is appropriate that the term developed from work with local West African communities because of regional characteristics of movement and adaptation. Lifescapes are more than physical landscapes. It implies a livelihood or production system which is linked, but not tied, to place; lifescapes are dynamic in both time and place.

People create landscapes, they produce nature and it is the people/people relationship in a local place which is the critical variable. To understand environmental phenomena in the context of a social environment, it is less appropriate to calculate carrying capacity as the followers of Malthus did, and more appropriate to examine human agency, as Boserup has done, to examine people's ability to create lifescapes.

Lifescapes are necessarily interactive. In this case study, three groups are analysed in threee different villages which have contrasting resource and population dynamics. A general summary of these three groups would be:

1. The Nuni, who are the indigenous, sedentary group. The Nuni were once the majority but now only make up 22 percent of the population in the province;
2. The Mossi, who are sedentary immigrants coming from the Mossi plateau in the north of the country. The Mossi now make up the majority (almost 50 percent) of the provincial population.
3. The Fulani, who are agro-pastoralist immigrants. The Fulani came from the northern regions of Burkina Faso with their cattle and now make up 11 percent of the population in the province.

In chapter two, the context for the lifescapes is provided with a description of the province of Sissili and an examination of the major influences on provincial production patterns, including Islamic influences.

In chapter three, the methodology for investigating lifescapes is presented and discussed. Here, the importance of prolonged contact with the study group is stressed, along with the advantages of working, not only researching, with those studied.

Chapter four culturally locates the lifescapes and their respective production patterns. The three ethnic groups with their major characteristics are presented which illustrates the diversity of practices in the province of Sissili.

Chapter five, six and seven present the three village case studies where the different ethnic groups are located in three villages providing a range of very different lifescapes. While the differences are explicit, it is also apparent that there are a variety of similarities between the ethnic groups and in the ways they have negotiated their positions in the lifescapes.

Chapter eight compares the differences and attempts to explain the processes of land use change in the three villages. This is then put into the context of the rural development project.

Finally, chapter nine concludes the study and explains how it is essential to place the idea of the lifescape in the centre of rural development efforts with local communities, and it is only by this method that we can understand African economies.

2. THE PROVINCE OF SISSILI

Chapter overview

This chapter introduces the province of Sissili, where the research was carried out. It serves to contextualise the case study villages in terms of the provincial economy and its physical (2.1) and socio-cultural (2.2) characteristics. The discussion then progresses to issues of resource use (2.3) and an analysis of the recent introduction of pastoralism (2.4) in the province. There follows an introduction to the three case study villages (2.5) and the influence of Islam on local communities (2.6). In 2.7, health in the household is discussed in relation to how it affects the household production system. Finally, in 2.8, the original hypotheses of the study are presented and it is shown how they proved inadequate to address the objective of understanding the changing production systems in southern Burkina Faso.

2.1 Physical environment

2.1.1 Location, climate and geography

The province of Sissili lies to the south of Burkina Faso (see figure 2.1) between the latitudes 10°59' and 12°0' North (corresponding to the Ghanaian frontier to the south) and between 1°18' and 2°53' West. It is bordered on its western limit by the Mouhoun valley, the Nazinon river runs along the north-eastern border and the Sissili river limits the province to the south east. Its total land surface covers 13,211 Km^2 which makes it 5 percent of the total land surface of Burkina Faso. The land surface is divided up into 13 administrative departments[1] and 533 villages.

1 The case study villages of Lon, Boutiourou and Saboué are located in the departments of Cassou, Léo and Biéha respectively.

Figure 2.1 The province of Sissili

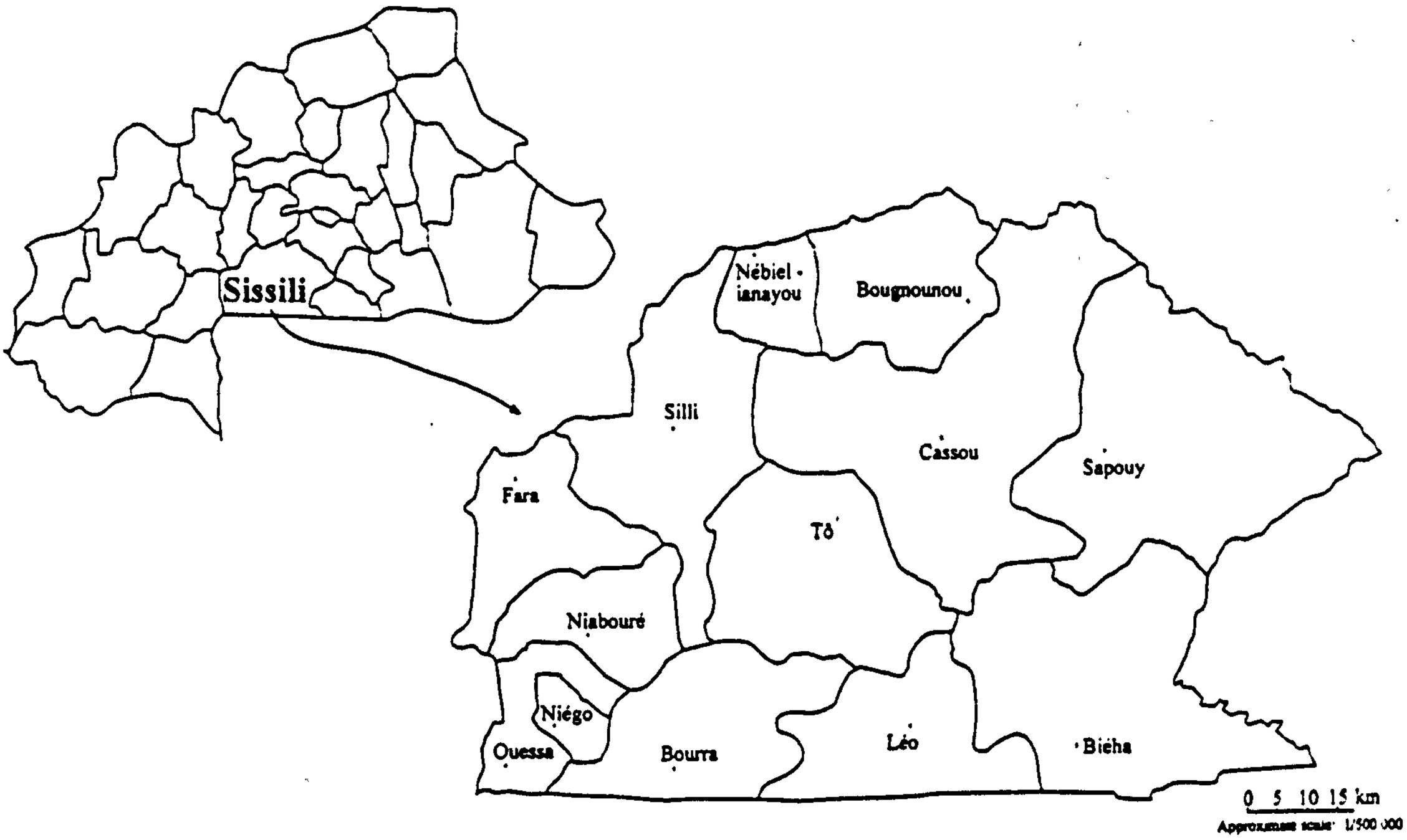


Table 2.1 The departments of Sissili and their land surface

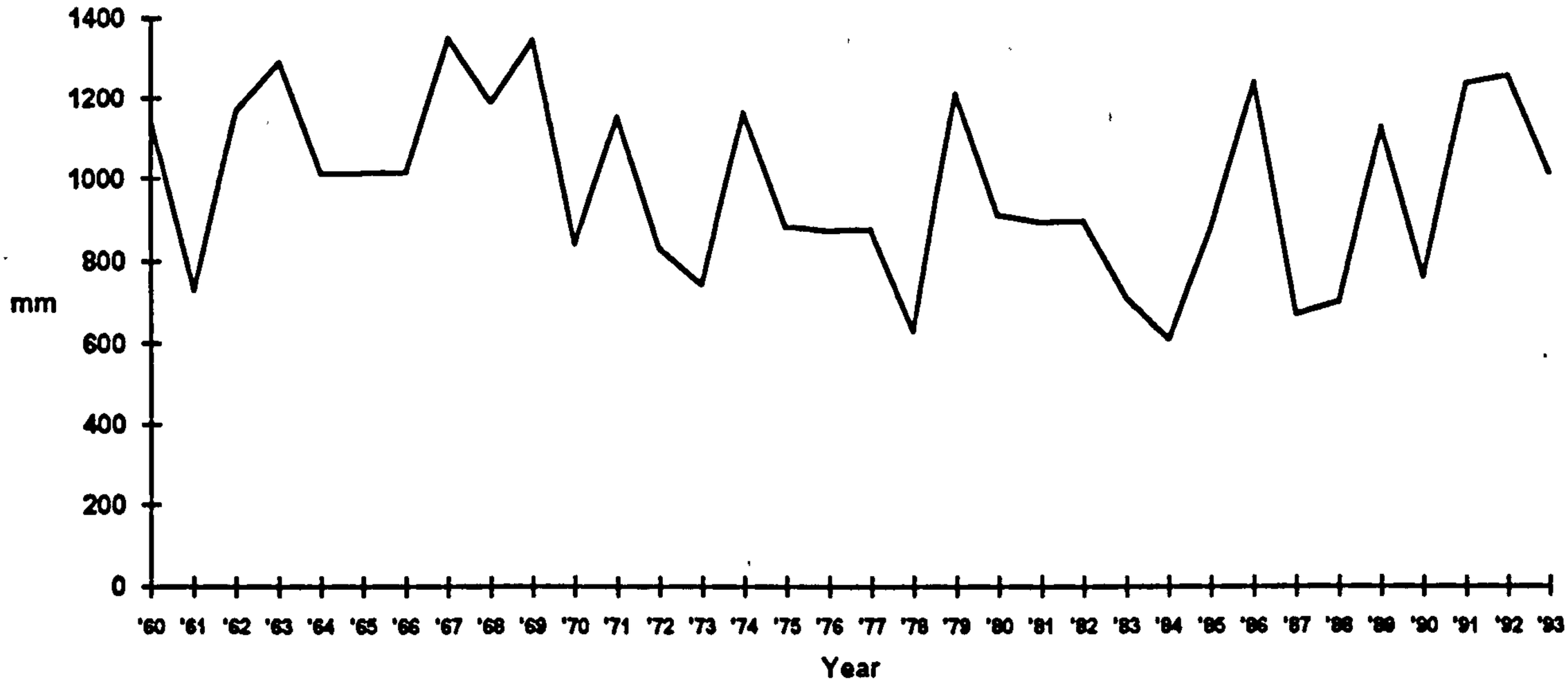
Department	Area km²
Biéha	1,669
Bougnounou	819
Bourra	1,102
Cassou	2,338
Fara	698
Léo	932
Tô	1,215
Nébiélianayou	400
Niabouri	519
Niégo	146
Ouessa	183
Sapouy	2,034
Silli	1,156
Total Province	**13,211**

Source: IBS, 1993

Sissili's climate is classified as sudano-guinean in the southern region, with a rainfall of 900 to 1200 mm per year, and sudano-sahelian in the northern zone, with a rainfall of 750 to 900 mm per year. The transition between these two different climatic zones is seen in cropping patterns, with cotton production dominating the northern areas and tuber production in the south. There is not a severe change in natural vegetation cover, although a rough division can be made between the boundaries of the departments of Tô and Cassou.

Rainfall comes over 130 and 150 days between May and October, with the past fifteen years having medium to poor rainfall. Mean temperature varies between 27°C and 34°C, with the hottest months being March and April. Annual rainfall (see figure 2.2) has been erratic. The potential average annual evapo-transpiration rate is 1744 mm (de Boer and Kessler, 1994).

Figure 2.2 Total annual rainfall in the province of Sissili, 1960 to 1993



Source: data from de Boer and Kessler, 1994 (for data between 1960 - 1991) and SPA, Léo (for data for 1992 and 1993).

The natural vegetation in Sissili varies between savanna and wooded savanna. The term 'wooded savanna' in this context is understood to mean a savanna made up of low and tall woody species (i.e. bushes and trees) associated with a more or less continuous grassy layer. This grassy layer is frequently destroyed by bush fire at the start or in the middle of the dry season which lasts from October to April (for bush fire distribution patterns in this region, see Millington *et al*, 1994).

The indigenous fauna of the province principally consists of bird species, wild pigs (*Phacochoerus aethiopicus*), antelope (*Hippotragus equinus*) and vervet (savanna) monkeys (*Cercopithecus aethiops*). However, in the Nazinga game reserve (part of which lies in Sissili) there are buffalo (*Synceros caffer*), elephant (*Loxodonta africana*), oribi (*Ourebia ourebi*), common duiker (*Sylvicapra grimmia*), red-flanked duiker (*Cephalophus rufilatus*), western hartebeest (*Alcelaphus buselaphus*), kob (*Kobus kob*), bush buck (*Tragelaphus scriptus*), waterbuck (*Kobus elipispirymnus*), bohar reedbuck (*Redunca redunca*), and olive baboon (*Paio anubis*) (Agrotechnik, 1991). There is little wild fauna outside of the game reserve because of over hunting by the local population. Not long ago, most of the above species were found widely distributed throughout the province and contributed significantly to food security.

There are three principal rivers: the Sissili that originates from the region of Beniou and flows towards the Nazinon forest reserve and continues through to the department of Biéha; the Nazinon, with its affluents the Kira and Selé which flows through the Nazinga forest reserve and the department of Sapouy; and the Mouhoun at the extreme west of the province that flows through the department of Fara, Niabouri and Ouessa.

There are two main soil types in Sissili:

- montmorillonite soils marked by newly formed argillics dominate on birrimian formations and on some eroded soils, swelling to develop a strong cation absorption capacity, with brown eutrophic soils or vertical brown soils associated with young soils or colluvial soils on slopes; and
- kaolinitic soils (non swelling argillic soils with a weak cationic reserve) found on covered peneplain plinthite formations with poor or leached tropical ferruginous soils and/or on hardened gravelly soils on peneplain summits or on shallow soils on secondary peneplain crusts (young eroded soils) (IBS, 1993).

Weakly hydromorphic tropical ferruginous soils are found in the valleys on colluvial/alluvial embankments (Bunasol, 1990). Mineral hydromorphic soils are found in some blocked valley bottoms, slightly gley and medium deep (Bunasol, 1990).

The agricultural potential of the soils is medium for the most part of the province, with medium deep tropical ferruginous soils being the soil type most commonly farmed. They are often full of crude elements but have a limited mineral reserve. They are suitable for most crops where water availability is sufficient. Certain brown eutrophic soils have a higher agricultural potential but are often found in the more hilly areas or they are found in limited areas in association with very poor soils (lithosols and young soils) (IBS, 1993). The Mouhoun has little irrigation potential (ferruginous soils with vertical tendencies with limited extension), like most secondary valleys in the province with the exception of some rice producing valley bottoms.

The natural relief in Sissili is monotonous and homogenous characterized by a regular topographic sequence, having the following characteristics:

- uncultivated laterite or granite capped mounds;
- soils on the slopes; gravelly ferruginous, sandy-limonitic, shallow, limited fertility, plinthic evolution, easily exhausted and eroded by agriculture;
- soils on slope bottoms; limonitic-sandy, medium fertility, deeper, much agricultural activity;
- valley bottoms with heavy, sandy soil.

The sandy-limonitic structure of the soils is linked to the low organic content, which makes the soils easily compacted, erodible and susceptible to run-off the longer it is farmed (Bunasol, 1990).

An important aspect to note, in table 2.2, is the low surface area of farmed land in relation to the total overall land surface and the dominance of long fallows over short fallows (715,000 ha compared to 107,000 ha). It should be noted that 1990 was a poor year for agricultural production having only approximately 700 mm of rainfall, but, in spite of this, there was still a 19 percent cereal surplus.

Table 2.2 General overview of the environmental and human situation in Sissili

	Unit of measurement	1990 situation
TOTAL SURFACE AREA	km^2	13,211
Unproductive land area (village, road, rock outcrops, etc.)	km^2	2,540
Managed forest area (sylvo-pastoral and village woodlands)	km^2	1,210
Land available for agriculture	km^2	9,461
POPULATION	persons	300,000
Density	per/km^2	22
Natural growth rate	percent	2.5
Permanent managed forest	ha	121,000
Land available for agriculture	ha	946,100
Cultivated area/person/yr	ha	0.5
Cultivated area/family	ha	5
Cultivated area/year	ha	137,000
Fallow	ha	809,050
Relationship between cultivated area and fallow area	coeff	5.5
Duration of cultivation	yr	7
Duration of fallow	yr	38
Fallow area (with a duration > 5 years)	ha	715,000
Fallow area (with a duration < 5 years)	ha	107,000
Natural wood production (0.83 m^3/ha/yr)		
Grands massifs	m^3	100,000
Fallow (> 5 years)	m^3	593,000
Total	m^3	693,000
Fuelwood needs (0.5 m^3/per/yr)	m^3	150,000
Fuelwood surplus	m^3	543,000
	percent	360
Agricultural production (expressed in sorghum equivalent)	t/ha	0.5
Yield	t	75,000
Annual production	kg	210
Cereal need/per/yr	t	63,000
Cereal needs of the population/yr	t	12,000
Cereal surplus	percent	19

Source: Agrotechnik, 1991.

2.1.2 Natural vegetation and land use

The province of Sissili contains a wealth of woody biomass, with total woody savanna covering around 60 percent of the province. The estimations of different land classes give roughly similar results:

Table 2.3 A Classification of land cover: Burkina Faso and Sissili

Land Classes	Burkina Faso[1] (ha)	Sissili[1] (ha)	Sissili[2] (ha)
• Forested/woody savanna	4,578,000	643,514	644,000
• Bush/shrub savanna (and burned areas)	10,184,000	178,420	178,000
• Gallery forest	270,000	13,400	13,400
• Thickets	387,000	24,200	24,200
• Agricultural land and fallows	11,980,000	382,225	445,550
• Unproductive agricultural land	no data	105,961	42,600
Total	27,399,000	1,321,100	1,321,100

Sources: [1] FAO, 1983.
[2] Gouvernement du Burkina Faso, 1986.

Table 2.3 shows that there is a high wooded area to farmland ratio and much of the wooded area is high quality forested savanna. In addition to the unprotected woody biomass, there also exists four areas of protected forest land in Sissili:

1. Nazinon forest (previously called the *Volta Rouge* forest) which covers 66,500 ha, of which 35,700 ha are in Pô national park.
2. Pô national park (the majority of which is in Sissili) with an area of 41,000 ha, 35,700 ha of which are in Nazinon forest, with 5,700 ha outside of the province.
3. Sissili forest park covering 37,000 ha, of which 15,600 ha make up the Yalé pasture zone.
4. Nazinga game ranch which covers 94,000 ha.

In 1993, the IBS classified local vegetation types in Sissili as a part of a provincial study on land use and vegetation patterns, largely based around the interpretation of satellite imagery. The IBS calculated surface areas under specific vegetation configurations. These can be used to measure the impact of human activity and vegetation recovery rates (i.e. fallows) in specific areas of the province. In the study, IBS give figures for the vegetation units corresponding to their occupation of the land space in Sissili as a whole and by department. From the figures, we see there are two dominant uses: firstly the medium density wooded savanna which occupies almost 63 percent of the province and, secondly, the deforested areas which take up almost 21 percent of the province. As an illustration and for future reference, the detailed occupation of space is given in table 2.4 for the departments of Cassou, Léo and Biéha (which contain the case study villages).

Table 2.4 The detailed occupation of space (in percent) for the departments of Cassou, Léo and Biéha and for the province of Sissili

	UNIT											
Depart -ment	C	B	A	S	I	N	H	R	M	Water	Urban	Total
Cassou	27.6	0.1	68.5	3.5	0.0	0.2	0.0	0.1	0.0	0.0	0.1	100
Léo	27.1	0.0	66.5	5.4	0.0	0.0	0.0	0.4	0.0	0.0	0.5	100
Biéha	9.1	30.3	48.1	12.0	0.0	0.2	0.0	0.3	0.0	0.0	0.1	100
Sissili	20.8	7.1	62.9	8.3	0.2	0.2	0.2	0.2	0.1	0.0	0.1	100

Source: IBS, 1993.

Key for Table 2.4

B Dense wooded savanna, homogenous
A Medium dense savanna, homogenous
S Low density wooded or bush savanna, heterogeneous
I Mixed grass and wooded savanna, very irregular
H Grassy savanna with rare or absent woody species
N Bare soil to very sparse savanna
R Ripicole or rice zones in humid valley bottoms
M Mixed cover: units N, B and R
C Deforested zones

Source: IBS, 1993

As can be seen from the above table, there remains significant portions of homogenous woody savanna, with Biéha having 30 percent of its area covered with dense savanna and almost 50 percent under medium dense homogenous savanna. The departments of Léo and Cassou, which are two densely populated departments, both have almost 70 percent medium dense homogenous savanna. These figures represent a province, not experiencing an environmental crisis, but under significant woody biomass cover.

2.1.3 Bush Fire

Burning the bush is a traditional agricultural and cultural practice and the majority of the population are involved in burning around their villages and fields. There are many reasons behind bush burning (which are all strongly linked to customary practice) and thus there are many different 'types' of fire. These include:

- fires to burn agricultural residues;
- fires to stimulate growth in perennial grasses;
- fires for hunting;
- fires for discouraging vermin (snakes, scorpions, rats, etc.);
- fires for bush burning;
- fires to improve soil fertility;
- fires to improve tree fruit harvest.

Fires are generally set in the mornings or early evenings, when there is no wind and temperatures are lower, so the fires can be more easily controlled (Schrekenberg, 1996). Usually several people work together, one setting the fire and the others keeping it under control with green branches.

Bush fires start in November when the vegetation begins to dry out and the burned area increases with the duration of the dry season. In many provinces, almost all the surface area is burned at some point in the year. In October to November, fires are classed as early fires or '*feu précoce*' and burn 30 percent of the total area. In the proceeding months, a maximum of ten percent is burnt and these are carefully controlled. Fires become more potentially damaging later in the dry season as vegetative matter loses much of its moisture content. The local communities use the early fires to burn vegetation close to sensitive areas (houses, plantations, fields still in cultivation, etc.) which consequently controls the later fires.

Bush fire destroys much of the herbaceous layer and almost all the dry annual grasses. Most of the dry annuals are lost towards February and March. Fire can destroy young trees, depending on when the fires occur, making tree regeneration difficult. Its positive effect is to stimulate growth in perennial grasses, burning dry and dead grasses, reducing soil shading and allowing more favorable conditions to resprouting perennials. de Vries and Djitèye (1982) explain that bush fire is a natural phenomenon and much of the natural vegetation is adapted to fire and indeed needs fire for seed germination. Bush fires are most dangerous when they come late in the season, the fires then attain high temperatures made

possible by a build up of combustible material created with the advance of the dry season. The high temperatures kill a wide range of regenerating tree species. Early fires however have positive effects on the seedlings, allowing them, because of the mildness of the fires, to regenerate. The dominance of early fires in this area can lead to an increase of woody species (see Boutrais and Bassett, 1996). A reason for bush fire, often expressed by the local population, is that if the burning is carried out early then this leads to a good harvest of the two most important local fruit trees: the shea nut (*Butyrospernum parkii*) and néré (*Parkia biglobosa*).

Fields and fallows remain less burnt than the surrounding bush. This may indicate a change in soil fertility management. Schreckenberg (1996) notes that cultivated fields that previously were burned after the harvest to clear them of weeds and to enrich the soil, now are left for grazing animals that enrich them with their manure. These fields will, however, be burnt just before the rainy season to clear them of weeds.

2.1.4 Vegetative production

Vegetative herbaceous production (including annual and perennial grasses but not tree production), measured in kilograms of dry matter per hectare per year (kg DM/ha/yr), varies greatly, depending on the quality of the soils and the availability of water. The least productive unit is found on rocky outcrops or shallow soils and the most productive area is found in the humid prairies and swamps where production reaches 9000 kg DM/ha/yr (de Boer, 1992). The level of vegetative production of the different vegetation zones, to a large extent, dictates the herding patterns of the local Fulani. For example, the IBS land units, C, H and b (fields, young fallows on slopes, on hill tops, and valley bottoms) are considered pasture zones. Their production is estimated at 3500, 3000 and 4000 kg DM/ha/yr respectively (de Boer, 1992). The figures on table 2.5 are an estimation of production rates related to the land classification units of de Boer (1992). (See appendix 2).

Table 2.5 Vegetative production of the herbaceous layer in kg DM/ha/yr in Sissili

Unit	Production Kg/DM/ha/yr
S	500
D	2750
Sb	3500
A	3300
R	4000
F	4000
P	9000
C - fallow	3500
H - fallow	3000
b - fallow	4000
B	4000
N	0

Source: de Boer 1992 based on Toutain, 1974.

de Boer (1992) calculated a considerable amount of dry matter production in the department of Tô, which is one of the most densely populated departments of Sissili, at 370 x 10^6 kg. Dry matter production in the woody biomass is higher in the valley bottoms or where tree density is high or where the soils are more fertile. It is interesting to note that woody vegetative production in young fallows (of 3-5 years) constitute an important percentage of dry matter production, with primary regeneration by *Dichrostachys cinerea*, *Piliostigma thonningii* and some *Mimosaceae*. Very young fallows (of 1-2 years) have a lower dry matter production as they are in the beginnings of regeneration.

Table 2.6 Vegetative production of the woody layer in Kg DM/Ha/Yr in Sissili

Unit	Production Kg DM/Ha/Yr
S	296
D	425
Sb	436
A	556
R	608
F	608
P	0
C - fallow	250
H - fallow	250
b - fallow	250
B	608
N	0

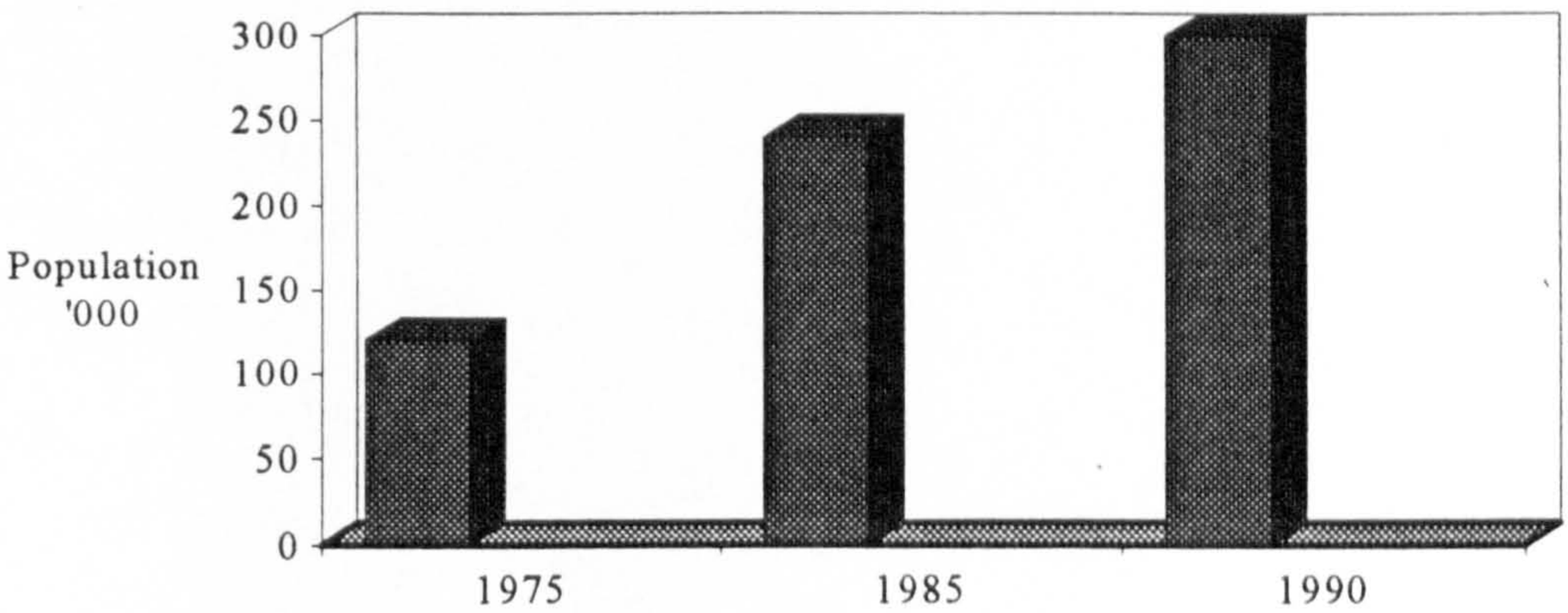
Source: Egging 1990 (except for units C, H and b, estimated by de Boer 1992)

2.2 Human resources and human systems

2.2.1 Population and ethnic groups

The population of Sissili is extremely young, almost 60 percent being under 20 years old. The majority of the under twenties are also men (63.7 percent). But the mature population shows a greater percentage of females than males, largely due to male migration for labour outside of Sissili.

Figure 2.3 Population growth in Sissili, 1975 - 1990.



Source: Official census 1975 and 1985; Agrotechnik (1991) for 1990 figures.

There are eight ethnic groups in Sissili which can be divided up into primary, secondary and tertiary groups. The primary ethnic groups include, the immigrant Mossi (46 percent of the population), the indigenous Nuni (22 percent) and the immigrant Fulani (11 percent). The secondary group include, the Dagari (8 percent) and the Sissala (3 percent), and the tertiary group holds the Lyele (2 percent), the Bobo (2 percent) and the Bwamu (2 percent). The remaining 3 percent are made up of other miscellaneous tribes. The various ethnic groups

have very distinct social characteristics which will be examined later in chapter 4.

Table 2.7 Areas of employment in the resident, active population of Sissili, (of 10 years or older) and by sex, 1985

Profession	Men	Women
All professions	64,978	65,909
Agriculture (including animal husbandry and fishing)	63,093	64,001
Higher administration, superior state civil servants	44	4
Lower administration	223	33
Manual labour, manual employees	256	51
Commerce	368	2,533
Craftsmen, artisans	3,222	135
Domestic services	253	52
Armed forces and security	328	-
Miscellaneous	-	7
Non-declared professions	64	63

Source: INSD, 1985 Census.

Table 2.7 gives an idea of principal areas of 'employment' or occupation in the active population (of 10 years or older). An aspect to employment that the above table does not show is the dominance of the Mossi ethnic group in the informal commerce and trading sector. Most *commerçants*, or traders, are Mossi and they are traditionally seen as the entrepreneurs, much like the Kikuyu of Kenya. They are seen by the Nuni as agents of economic prosperity rather than heartless exploiters of cheap labour (as the Lebanese in the major towns of Burkina Faso are).

In Burkina Faso, 51 percent of the population are engaged in 'active work', i.e. make up the labour force, the remaining are either too old or too young. In an average family size of 11 (one man, two women, four boys and four girls), 6 people make up the labour force. The INSD indicates that the working age starts at 10 years for boys and girls. Burkina Faso is a country of low levels of education and is dominated by traditional agriculture, where child labour makes up an important part of the total. Village size, table 2.8, reflects this pattern of agricultural work.

Table 2.8 Village size and frequency in Sissili (1985)

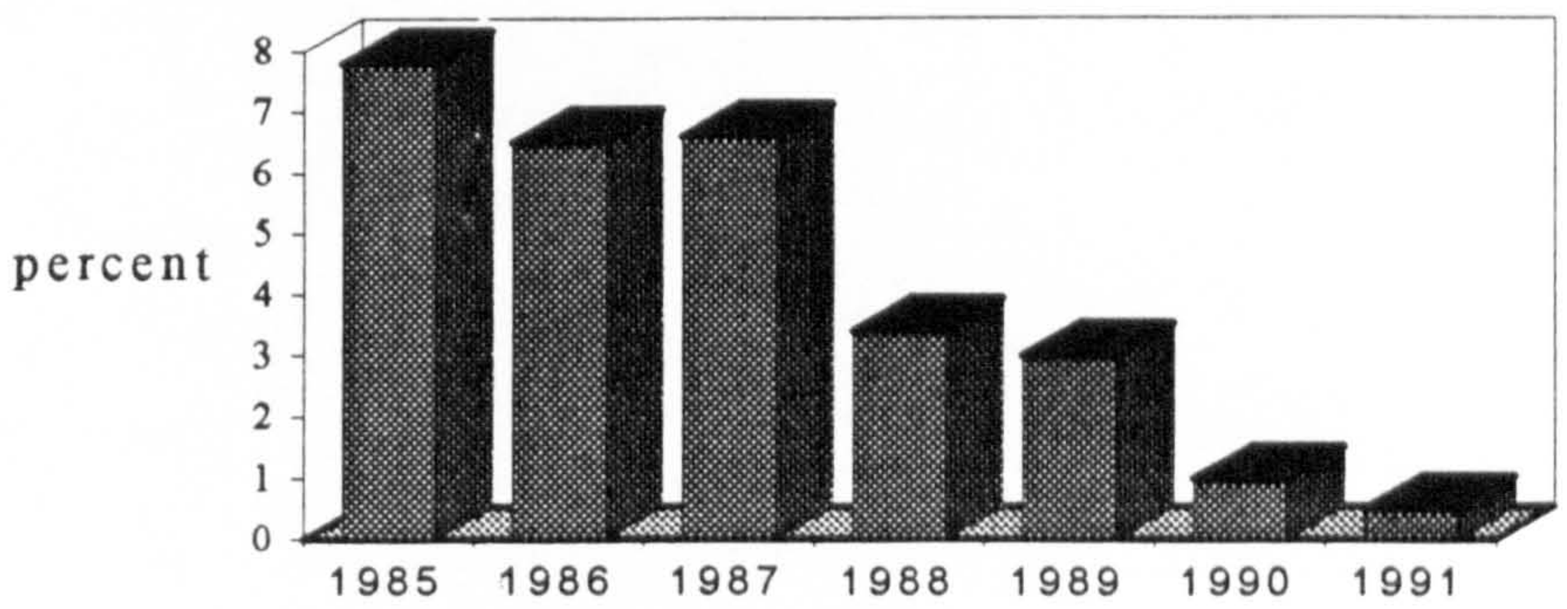
Population	0-199	200-499	500-749	750-999	1000-1499	1500-1999	2000-5000
Village size frequency	13.9 percent	27.8 percent	19.5 percent	13.2 percent	12.8 percent	4.37 percent	6.96 percent

Source: Berger Sarl, 1989.

2.2.2 Immigration

Immigration began in the 1970s with the onset of the Sahelian droughts and continued up until the late 1980s. It has, however, tailed off almost to a stop due to the good rains throughout the country in recent years. The immigrants come almost exclusively from the northern Mossi plateau and are mostly Mossi and Fulani. Figure 2.4 provides an example from the department of Cassou which shows a significant drop in the population growth from 1985, which was the peak of immigration, to 1991 when immigration has almost stopped.

Figure 2.4 Population growth in the department of Cassou, 1985 - 1991



Source: Data from Burkina Faso census, 1985, Berger-Sarl, 1989 and PDR (*Sixiéme* FED) for 1990 and 1991.

There are no figures on the actual numbers of immigrants who have entered the province, though indications can be found. The population growth rate from 1975 to 1985 was at 7.8 percent while normally it is between 2.5 to 3.5 percent. The Mossi now make up the majority, making up roughly 50 percent of the total population, in a province previously dominated by the Nuni ethnic groups. Table 2.9 shows the population growth for the

department of Tô but is indicative of the levels of growth rates in parts of the province which have been heavily affected by immigration.

Table 2.9 Population growth by ethnic group in the department of Tô, 1985-1991

Year	Nuni	Mossi	Fulani	Total	Growth Rate
1985	9,741	17,111	2,066	29,518	7.8 percent
1986	10,033	19,150	2,664	31,847	6.5 percent
1987	10,334	20,708	2,879	33,921	6.6 percent
1988	10,644	22,388	3,120	36,152	3.4 percent
1989	10,964	23,135	3,266	37,365	3.0 percent
1990	11,292	23,829	3,363	38,484	3.0 percent
1991	11,631	24,544	3,464	39,638	3.0 percent

Source: Bassolet *et al*, 1989.

The highest concentration of immigrants is found along the central north-south axis and in south-west Sissili, with the highest populations around Tô and Cassou. Sapouy also has high concentrations of immigrants but has traditionally been a point of arrival for Mossi settlers stretching back to the years before the droughts. Léo, being the provincial capital, has attracted many of the more wealthy Mossi, including artisans and traders. The departments of Biéha and Niabouri have attracted northern immigrant farmers because of their good soils. Table 2.10 gives a breakdown of population growth in Sissili by department.

Immigration has been caused by a series of environmental push factors brought on by a succession of serious drought periods in the north of Burkina Faso. The zones of departure fall into the sahelian and sudano-sahelian climatic regions which, in Burkina Faso, are characterised by low rainfall (400/500 mm per year), high population densities, poor soils, low harvests and degraded land areas. Since the 1970s, these areas have seen a steady decline in both the agricultural and prevailing economic systems. For example, in Yatenga province in the north (one of the major departure zones for immigrants into Sissili) the normal yearly rainfall is around 735 mm, but from 1970 to 1980 it fell to 575 mm and further still to 491 mm in the period 1980 to 1988 (see table 2.11)

Table 2.10 Population growth by department, 1975 to 1985

Department	Population Growth, 1975 - 1985 (percent)
Tô	200.35
Cassou	197.8
Sapouy	168.52
Léo	114.30
Biéha	133.9
Niabouri	103.07
Ouessa	80.9
Silly	79.54
Bougnounou	75.8
Bourra	55.17
Fara	38.87
Nébiélianayou	26.74
Niégo	18.76
Total Provincial Growth	104.56

Source: Bassolet *et al*, 1989

Table 2.11 Climatological data from Yatenga province, 1979 - 1988

	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
Temperature (°C)	29.5	29.0	29.1	29.4	29.4	29.0	29.2	28.5	29.7	30.6
Divergence from the mean	0.8	0.3	0.4	0.7	0.7	0.3	0.5	-0.2	1	1.9
Annual Rainfall (mm)	578.6	576.1	576.1	360.1	360.1	393	421	570	456	707
Divergence from the mean (mm)	-54.7	-57.2	-57.2	-273.2	-273.2	-240.3	-212.3	-63.3	-177.3	73.7
Evaporation (mm)	2234.8	2209	2209	2491.4	2491.4	4101	4034	3822	3874	3681.6

Source: INSD, 1993.

Harvests in the northern areas have been insufficient to sustain populations in the context of successive years of poor rainfall. The national figure for basic cereal consumption in 1988/89 was 237 kg per person. Cereal production in the northern region at the same time varied from 125 kg/per to 180 kg/per, showing a cereal deficit. Land shortage has also become a major problem in the emigration zones, with people only having access to approximately 1.5 hectares of land (Bassolet *et al*, 1991).

Bassolet *et al* (1991) examine migration characteristics and point out that the decision to migrate is complex and dependent on many different factors. Although the immigrants are motivated mainly by economic incentives, (e.g. the thought of higher agricultural production, the search for work, search for money and to heighten their social position), they are also psychologically motivated by aspects such as family conflicts, lack of freedom experienced by youths, lack of marriageable women and the need to access better physical, and by implication, social, facilities. The decision to migrate can be divided into a collective decision or individual decision. In Bassolet's study, more than 50 percent of the immigrants took a collective decision with the support of their family. This decision was based on the agreement that immigrants, once settled, will support their family in the emigration zone, by sending money or food back (migrant remittance). In reality, however, this rarely happens with around 80 percent of immigrants, who initially thought they would send money or food, sending no remuneration back to their 'homes' despite being considerably better off in their new 'homes' (89 percent of immigrants said they have better living conditions in Sissili (Bassolet *et al*, 1991)). Immigration was also facilitated if the immigrant had family, friends or ethnic ties already in the province.

On arrival the first immigrants experienced few problems, most had no trouble finding 'employment' in their first month of arriving. Figures show that 86.2 percent had found agricultural work (i.e. they had secured a piece of land to farm), 9.2 percent were involved with animal husbandry (the Fulani were grazing their cattle) and the remaining 4.2 percent had found miscellaneous work in artisanal activities, small commerce, etc. (Bassolet *et al*, 1991).

The immigrants have become well established in Sissili, with the majority of immigrants intending to stay. At the present moment, the language of communication in Sissili is Mooré, the language of the Mossi immigrants, indicating the numbers installed in the province and the levels of cultural integration.

Table 2.12 The positive and negative effects of immigration

Effects on departure zone	Effects on arrival zone
Positive effects: • short term increase in household's food supply; • transfer of money and food from the migrants' destination point; • decreased pressure on land resources.	Positive effects: • increased land productivity; • new expertise and professions; • cultural exchange.
Negative effects: • disruption of the division of labour, increased burden on women, old and very young; • lowered agricultural production; • less diversified economic activities of the household unit; • tension and breakdown of family structure; • decrease in men for marriage (higher percentage of women to men)	Negative effects: • pressure on land resources; • disruption of social structure; • pressure on local laws and customs; • pressure on local resources - infrastructure, services, goods.

Source: Howorth, 1997.

Table 2.12 shows, the departure zones have experienced various negative impacts, including disruption of family structure, the creation of social problems, and most importantly, labour shortage because of imbalance in the sex ratio of men to women. In 1975, in the northern province of Yatenga, there were 98 men to 100 women, in 1985 the figure had fallen to 84 men to 100 women (the national average in 93/100). As a comparison, in the province of Sissili, in 1975 there were 101 men to 100 women, but in 1985, because of migration (to Côte D'Ivoire, Ghana and towns and cities in Burkina Faso), the number had dropped to 95/100. The most critical consequence of immigration on the zones of departure is rural village depopulation.

Table 2.13 Intended destination of people with the intention to migrate in four provinces: Sissili, Namantenga, Yatenga and Soum (the latter three are northern provinces)

Destination	Sissili (percent)	Namentenga (percent)	Yatenga and Soum (percent)
Town in Burkina Faso	13.8	16.2	22.2
Village in Burkina Faso	6.2	60.0	72.2
Another African country	80.0	23.7	5.6

Source: adapted from Bassolet *et al*, 1991.

Table 2.13 shows the difference in the role of migration in the respective provinces. In the north, people migrate to secure agricultural land for a primarily subsistence role. In Sissili,

people migrate to supplement agricultural incomes by searching for seasonal paid labour.

Agrotechnik (1991) has speculated on the following consequences of further population increases in the province of Sissili:

- a growth in the average household cultivated land area from 5 to 7 ha;
- a growth of the total cultivated surface from 11 percent to 36 percent of the provincial surface area;
- a lowering of soil quality reducing the length of cultivation from 7 to 3 years;
- an expansion of agriculture onto marginal lands;
- an increase of resource conflicts between herders and farmers;
- a decrease in (sorghum) harvest from 500 kg to 300 kg per hectare (by 2.5 percent per year).

A popular and dark future scenario (a 'crisis narrative') for the province, led by analyses such as the one put forward by Agrotechnik, has described the likelihood of; a total disappearance of savanna zones and forested fallows, an upkeep of only delimited forest zones, and the development of a fuelwood deficit for Sissili and its urban centres. The loss of the fallow lands will lead to the loss of organic soil materials especially in the humific horizons, an increase in runoff created by soil compacting especially in cleared and weeded fields and, probably the most worrying, a lowering of the water tables. Agrotechnik suggested that the province can only support 30 persons per km^2 without irreparable damage. This analysis is open to question and will be discussed further.

2.2.3 Administrative and local political structures

The province of Sissili is one of thirty provinces in Burkina Faso and is administered by a high commissioner (*Haute Commisaire*). Within the province there are 13 departments (out of 300 in the country) each of which has a prefect (*préfet*) as the administrative head. The high commissioner and the prefect are selected by the ruling political party, *Le Front Populaire*. The high commissioner is directly under state authority and is the representative of the *Le Front Populaire*, the Government and its ministries. The commissioner

coordinates provincial activities and has responsibility for the development of the province. Each province is officially financially self sufficient through the collection of local taxes and operational permits (Engberg-Pedersen, 1995:3).

The provinces and departments are administrative units that have been decentralized and 'deconcentrated' since the State ordinance of 14/11/83 under the reorganization of the provincial structures (Berger Sarl, 1989). Despite this decentralization and deconcentration, some ministries have succeeded in gaining a foothold in the provinces; such is the case for Sissili. In Sissili, there exist: the Ministry of Environment and Tourism (*Ministère de l'Environnement et du Tourisme*); the Ministry of Education (*Ministère de l'Education de Base et l'Alphabetisation des Masses*); Ministry of Health (*Ministère de la Santé*); the Social Security (*L'Action Social*); Ministry of Cooperative Peasant Action (*Ministére de l'Action Cooperative Paysanne*); and the public works (*Le Désenclavement - Travaux Public*). Most other ministries, like the Ministry of Planning and Cooperation and the Ministry of Agriculture are based in Koudougou, the third largest urban conglomeration in Burkina, 160 kilometres from Léo.

Each village is represented by a '*délégé*', a village delegate who has been elected by the whole village. It is the delegate who receives government instructions, attends local government meetings and is charged with carrying out instructions at the village level. Previously, in the time of Thomas Sankara, there existed Revolutionary Committees (*Les Comités Revolutionaires*). These came before the system of the *délégé*, that was introduced after the Sankara administration by his replacement, Blaise Campaoré. The Revolutionary Committees were created by *Le Front Populaire* in order to 'mobilize, conscientize and organize the people at every revolutionary level and action in the domains of politics, economics, society, culture and security' (Berger Sarl, 1989). The Revolutionary Committees were supposed to have existed in every village but some were more operational than others.

A major problem the Government faced was how to make direct contact with the villagers in order to create a democratic platform for investment at the village level. Previously, there had been little or no contact between departmental prefects and the village representatives. This was partly due to the isolation of the village, the illiteracy of the peasants (discussed

later) and partly due to the absence of any organizational or institutional structures at the village level that could be used as planning forums. For these reasons, Sankara began a '*Gestion de Terroirs*' (see Box 2.1) programme with the aim of creating local structures thereby giving the peasants a voice in their own development and thus bridging the administrative gap. However, Campaoré stopped all efforts and '*Gestion de Terroirs*' has now become a land management tool rather than a direct political force.

Box 2.1 ***Gestion de Terroirs***

The origins of *Gestion de Terroirs* can be traced back to the mid 1980s from the Government of the socialist leader of Burkina Faso, Thomas Sankara. It came from the need for an extra level of governance at the village level. At that time there were four levels of administrative structures; national Government, regional level administration, provincial level administration, and district administration. Below this, on the village level, there was no structure that allowed for planning or administrative activities for development purposes.

The Government of Burkina Faso created an institution called *le Programme Sahel Burkinabè* (PSB), which was officially attached to all the ministry offices, with support from international donors to co-ordinate development activities. Sankara and PSB had talks on how the Government could co-ordinate all development projects and develop structures for bottom-up planning. This came from the rationale that, without structures at the village level, there can be no discussions about investment and planning. The concept of *Gestion de Terroirs* was developed to provide community organisational structures to allow for bottom-up planning and project co-ordination.

Gestion de Terroirs originated from a political will to improve national planning and investment from a grassroots base, i.e. the village, through building organisational and institutional structures. Unfortunately, the initiative started by Sankara was not carried through by the present president, Blaise Campaoré. In the last few years, *Gestion de Terroirs* has been revived as a development approach and has been formalised, most recently by the United Nation Sahelian Office (UNSO). In essence, it is a response to land management in areas that have experienced high localised population growth and are consequently undergoing a management crisis, i.e. as local situations change, old management practices are no longer effective for resource management and so new systems need to be developed. It was recognised that there was a need to make village communities responsible and to protect and restore natural resources with specific reference to the water-soil-vegetation complex. The word **'terroir'** essentially means 'land' but is defined as a spatial entity traditionally managed by a village community ('the village') which has occupation and exploitation rights founded on accepted responsibility and a competence recognised by all users of the 'terroir' i.e. a land territory under a common property management scheme (UNSO, 1994).

2.3 Issues of resource use in Sissili

2.3.1 Background

Previous to the large tide of immigration that resulted from the 1970s droughts, Sissili was province characterised by a low population living in a large land area which was naturally endowed with a significant stock of natural resources, the most critical of which was woody biomass. Today however, the situation is no longer the same; the population has more than doubled in the last twenty years and agricultural activity has not only increased but the agricultural management systems are also changing. These are the obvious results of immigration but there are also other important implications. There is the introduction of other cultures, the introduction of Islam and the introduction of new skills and information. The indigenous populations' cultural identities are often challenged and conflicts of control may possibly arise, the language of communication changes to the language of the immigrant. The previously dominant tribal group now becomes the minority.

2.3.2 Agricultural characteristics

The Nuni

The Nuni practice a 'gentle' form of agriculture which is exclusively manual with little inputs, relatively low soil usage and use approximately 4.5 hectares per family. Crops grown include: yam, maize, sorghum, millet, groundnut, sweet potato, cowpea, *pois de terre*, black-eyed beans and cotton. Yams are cultivated within large mounds (*buttes*) and other crops with small mounds. This is a very important characteristic of Nuni farming, indicating a very labour intensive farming technique requiring hand work with a small hand hoe (called a **daba** in Nuni, see figure 2.5[2]). The technique is indicative of bush farming, i.e. farming in the presence of a large number of trees and root systems, and does not cause great disturbance to the local agro-ecological system (including the local vegetation and soils). Fields are farmed for an average of four to five years with fallows traditionally being 20 to 30 years. The Nuni also include uprooted weeds in their soil turning methods, again adding to soil structure. Women have their own small fields, dominated by groundnut

[2] The agricultural tools in this diagram are common to all ethnic groups, the Nuni, Mossi and Fulani.

cultivation, which act as a cash crop. They sometimes help their husbands with seeding and some parts of the harvest. No private tenure management is practised, i.e. land cannot be formally owned by an individual.

Agrotechnik (1991) concluded that the Nuni are preoccupied by short term gains, characterised by:

- ensuring enough food for the year and minimum economic gains;
- the diversification of non-agricultural activities or migration to other areas in search of off-season work;
- minimizing time spent on agricultural activities;
- a lack of investment in agricultural infrastructure;
- the priority of social investment;
- an ignorance of the problem or urgence of protection of land resources or the control of agricultural exploitation; and
- a belief that migration is always possible if things get too bad.

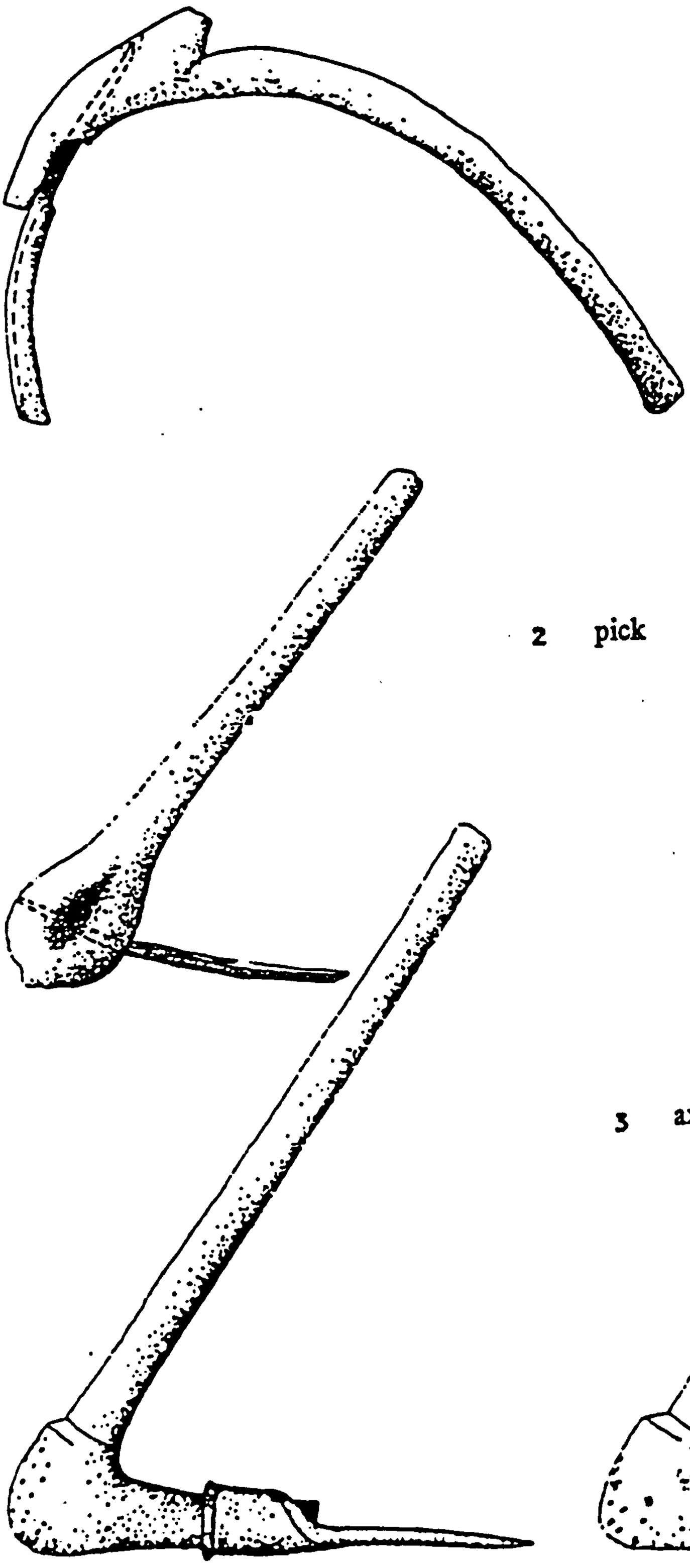
The latter two points are contested in this thesis. The author will argue that the Nuni take a leading role in the protection of the resource base and the production of nature. This will be examined in later chapters.

The Mossi

The Mossi practice an extensive form of agriculture with almost total field clearing, mainly for cereal production. On average, each family cultivates 6 hectares. Women participate fully in all aspects of farming, adding a level of 'aggressiveness' (Agrotechnik, 1991).

The Mossi arrived in an unknown landscape and imported farming techniques (dominated by the cereal cropping, mainly millet and sorghum) that were taken from generations of farming in a dry Sahelian environment. However, the Mossi have begun to adopt indigenous management practises and started growing crops grown traditionally by the Nuni, but, unlike the Nuni, the Mossi increasingly seek to take advantage of economic opportunities and the women are involved with all agricultural activities.

Figure 2.5 Agricultural tools



Source: Savonnet, 1970

The Fulani

The Fulani are agropastoralists and have recently come to Sissili, although some came earlier to herd the cattle of the Nuni. In total, 7 percent of the Fulani arrived more than twenty years ago, the rest, 93 percent, have arrived in the last fifteen years. The main reason behind the immigration was resource degradation in the north and a consequent lack of pasture and dry season watering points.

The Fulani are organised in family groups, men with their wives and children, in one camp, each adult with their own grass hut. They have a patrilineal system with the sons staying with the father and the eldest becoming chief of the camp on the death of the father. A camp is often composed of a number of conjugal units with brothers of the household head ,with their wives and children. At a higher level of social organisation, groups of families are attached by a common ancestor, usually a chief of a lineage. However, in Sissili, this lineage is often weak because many of the family group live outside the region, which leads to a level of isolation.

The Fulani and their Zebu cattle traditionally practice a transhumance towards the south of Sissili in the dry season in search of watering points. With the progression of time, however, the Fulani have settled in most departments in Sissili. They tend to concentrate their animal herding in the zones of low intensity agriculture, for example in the forest reserves of Nazinon or Sissili, or in the periphery/wooded areas of the village's territory. As an agro-pastoral system, animal rearing offers much higher economic returns than the traditional agriculture. Fulani farmers cultivate roughly 2 hectares per family in old pasture zones which contain high levels of cattle manure and, consequently, harvests are usually comparatively high. In some areas, there exist conflicts between the Fulani and the sedentary farmers because of straying cattle and crop damage in the rainy season, these however are rarely serious and are usually resolved amicably.

Table 2.14 A summary of some agricultural characteristics of the three main ethnic groups in Sissili

Description	Nuni	Mossi	Fulani
Production system	Farming/sedentary	Farming/sedentary	Agropastoralism/semi-nomadic
Dominant crops grown	Tubers and cereals	Cereals	Cereals
Average cultivated area	4.5 hectares	6 hectares	1.5 hectares
Language	Nuni	Mooré	Fulfulbé

Source: Howorth, 1997.

The endurance, but gradual erosion, of 'traditional' farming systems in Sissili, compared to other regions of Burkina Faso, is due to its relative isolation. New agricultural crops and techniques (like cotton growing and the introduction of ox-drawn ploughs) have only developed after the advent of the arrival of the immigrants. Farming is very labour intensive: each year roughly 93,000 hectares are farmed in Sissili (Berger Sarl, 1989) needing an estimated 11 million labour days, thus 129 days per hectare per active person (from 10 to 60 years old). By comparison, external farm inputs are low, with a total provincial spending of 158 million FCFA on agriculture (e.g. fertiliser, seeds and pesticide), or 1700 FCFA per hectare. The cost of farm labour per person per day in 1994 was 600 FCFA for cereals and 1200 FCFA for tuber fields.

2.3.3 Land tenure

Local tenure management in Sissili has developed over many years and exists as a complex and dynamic system. Agrotechnik (1991) has identified certain characteristics within that system:

- the system has been formed over many years in the context of a substantial land surface;
- it has been formed with the traditional Nuni farming systems in mind and with the potential and occurrence of high mobility;
- the land is conceived as a religious entity, permitting the living to keep in touch with their ancestors and spirits, thus certain taboos and sacred points exist;

- the 'middleman' between the individual and the spirits is the land chief (*le Chef de Terre*), who gives land to people who need to farm;
- only a serious transgression, either social or religious can lead to a refusal of land;
- the level of land appropriation has various grades according to the type of field; they include the household fields in the habitation zone where appropriation is controlled by the individual families, the fields of the village canton (or neighbourhood, see glossary in appendix 1), which is under the control of a clan (or family lineage), and bush fields again controlled by the clan but can be 'given' to strangers. The land chief, however, controls all decisions and his word is final;
- social standing is accorded at birth and rising up the social ladder is not possible; in the case of breaches in the social code the individual can be excluded from the group or more seriously be condemned to death;
- private property is not practiced.

These traditional systems act as a very complex set of rules that are further complicated by the administrative structure, that consists of three different types of authority in three different persons. These different positions of authority are made up of: the land chief (of the local ethnic group), the village chief (le *Chef de Village* - the customary chief, a member of the original colonizing clan) and the administrative representative working for the State. This relationship is problematic because there is a high level of illiteracy among elites making direct communication obligatory. There is also confusion created by the existence of allegiances and hierarchies between villages and the existence of pieces of land in the middle of villages governed by old laws from other villages as is the case with the three village case studies.

Agrotechnik (1991) has suggested a number of characteristics that will lead to the development of a breakdown in traditional tenure management systems. They examined the evolution of the breakdown of tenure systems in the Mossi plateau, with a high population density (50 to 100 per/km^2) and give indications of how tenure systems in Sissili may develop under similar population densities. This evolution is thought to be characterised by:

- the 'rigidification' of the system of progressive land appropriation, without title deeds, by

a system of land ownership by each clan (or village canton) and, within this, the fixation of land by individual families;

- the desire of young men to reject the customary land tenure management system by farming individually with cash crops;
- the emergence of the notion of land 'exchange value';
- the development of land 'loans' to immigrants in exchange for money or other exchanges without titles or juristic meaning (deeds or knowledge), to the benefit of village chiefs or village canton chiefs;
- securing land types outlined above, after having 'paid' thus giving the 'right of entry';
- land shortage, thus giving the need to secure farmed space;
- the difficulty of access by government agents to villages and their customs and/or rules, to treat tenure problems and conflicts.

This, however, represents a forecast based on a western interpretation of land use change which is not controlled by strictly enforced rules. African tenure systems fall outside conventional or modern views because they deal with both the land and the resources directly linked to it. From a technical and economic point of view, tenure systems determine the management and allocation of a set of productive resources, they also organize access to ground-based natural resources and determine the appropriation mechanisms for these resources and the security of ownership or useage rights over them (Thébaud, 1995). By doing this, such systems help to define a series of economic and institutional incentives relating to the various possible ways of using these resources (Thébaud, 1995).

In terms of state influence, there have been a number of attempts at reducing traditional control over land. The agrarian and tenure bill *'Une Réforme Agraire et Foncière, ordonnance no.84 du 4/8/1984 et décret de 4/8/1985*, (a substantial document of 666 articles), gave all land in Burkina Faso to the state, removing cultural or traditional landrights, with the objective of the rational redistribution of land. The bill states it is necessary to destroy the traditional agrarian and tenure laws 'characterised by the mark of the bourgeois and feudal systems and thus used against the labouring masses'. However, because of the weakness of the administrative structure and the impenetrability of the village, the directive has had no effect. In addition, if the directive were to turn into a

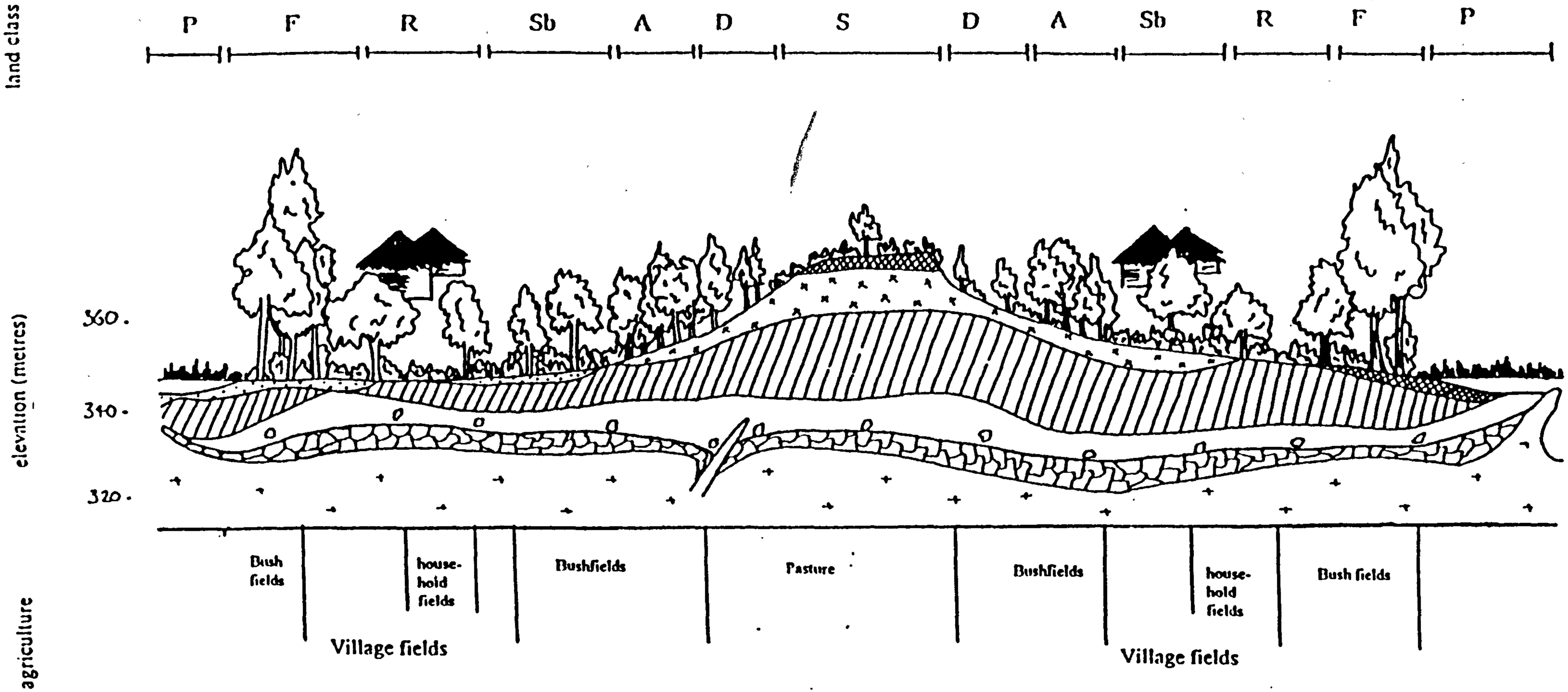
reality, it would make tenure rights unclear and lead to land insecurity in all aspects.

2.3.4 The development of the agricultural landscape

The rural countryside of Sissili, and its consequent occupation of space, has been defined and created by conscious historical processes based on the different values placed on different resources. The village, and agricultural landscape around those villages, shows a distinct pattern throughout Sissili. The Nuni have deliberately settled in a particular topographical sequence and ecological niche along the local catena. The catena consists of a plateaued hilltop leading down on both sides to a valley bottom with soils ranging from rocky outcrops to alluvial soils, with each section of the landform having specific vegetation configurations, with the soils on the lower slopes being the deepest and most fertile. Throughout the province of Sissili, villages occupy the same space on the lower slopes (here the household fields are found and some village fields, that spread onto the soils on the upper slopes and into valley bottoms).

Figure 2.6 is based on the soils in Cassou but is found throughout the province. It shows the soil catenary sequence, land use and vegetation in Sissili. This has the vegetation classes on according to de Boer (1992), elevation, location of agricultural fields and the catenary sequence. A catena consists of three main parts or complexes: an elluvial complex on the upper slopes of the undulations from which solid materials are washed off along the surface and colloidal materials removed downwards by seepage; a colluvial complex on the lower slopes where there is a graded series of deposition down the slope from the coarser materials at the top to the finer at the valley bottom; and an illuvial complex occupying the valley bottom which receives most of its materials by seepage (Hopkins, 1974).

Figure 2.6 The soil catenary sequence and soil profile, land use and vegetation in Sissili



Source: adapted from van der Zee & Plaiser, 1983, de Boer, 1992 and FAO BKF/87/020, 1990

The Nuni villages are located on land according to its potential. Thus, the historic spacing of villages reflects a density of people in equilibrium with the agricultural (and thus soil potential) resources of the province, with the exception of some drainage areas where onchocerosis was rife in the past. When two villages are separated by large distances (from around 8 to 10 km), it is very likely that there will be a presence of 'tanga' soils, with weak agricultural characteristics (having lateritic crusts and a high gravel content) together with a lack of water points. In all cases, however, the village has its own definite space. The zones far away from the village are not a no man's land but exist as a collective resource for pasture or for harvesting wood products. The occupation of space in and around the village is progressive, measured by the growth of the village and the needs of the population.

This is a pre-immigrant landscape where the Nuni were the sole inhabitants. What we see now is a landscape influenced by a new social arrangement. The land or village chief has allocated land (old fallows) to the immigrants, both the Mossi and Fulani. In the case of Boutiourou (chapter 6), the Mossi have been 'given' a section of the village land to use as their own, to manage and to farm; this is now the 'Mossi's land'[3]. The Fulani prefer the relative solitude of the woodlands in the village's territory. Here the Fulani can guard their cattle away from the village and bush fields of the Nuni and Mossi and also have access to good pasture. The values placed on the resources along the catena by the Nuni chiefs dictate the exploitation patterns, settlement patterns and conservation areas.

The immigrants have generally been given the less fertile areas of the upper slopes. The Mossi, coming from a different environmental background, do not have the same perception of the local environment and the ecological equilibrium as the indigenous Nuni, and they practice an almost total clearing of trees for their agricultural space and leave vast spaces of uncovered soil (Berger Sarl, 1989). The only exception is leaving the *Butyrospernum parkii* and *Parkia biglobosa* species which the Nuni reserve the right to harvest, but usually harvesting rights are passed over to the immigrants (the Mossi).

3 Note that all reference to ownership is given in inverted commas because there is no formal private property, only rights of use. All land belongs to the village and is controlled either by the village chief (*Chef de Village*), or more usually, the land chief (*Chef de Terre*).

Women also have different value systems because they use some areas of the territory more frequently than the men. For example, there are certain areas which are almost seen as 'women's areas', such as upper slopes and hilltops because it is here that the majority of forest gathering (including fuelwood) is done. There are even sacred women's sites that only women can exploit, such as sacred streams or groves.

2.3.5 Soil types and indigenous soil classification

The Nuni and Mossi recognise different soil types in relation to where they are found on the catena (figure 2.6), their texture and their cropping capability. Both the Nuni and the Mossi have different names for the different soils and also for the catenary positions where those soils are found (see figure 2.7). For example, the Nuni word for the plateau on the catena is **pang**, and the word for the soil types found there are: **pio** for lithosols that have originated from a granite parent material, and **diga** for lithosols that have developed from a laterite material. In Mooré the corresponding names are **tanghin** and **kougouri** respectively. These soils are occupied by bushy savanna and are reserved for pasture, hunting and gathering purposes. These are the most marginal agricultural areas. On the cliffs just below the plateau, depending on aspect, the Nuni identify two areas: **dundulutia** meaning a piece of land which only supports small and stunted undergrowth and bushes; or **petia**, which is a piece of land with rocks that supports abundant undergrowth and is characterised by *Burkea africana* and *B. parkii*.

The upper slopes are called **dio** in Nuni. They correspond to the Mossi **zingdongo** or **zinka**. The soils in this part of the catena are principally ferruginous soils on gravely material. The Nuni call the soil in these areas **kapafounoutia** (the **tia** at the end of the word meaning soil). In Mooré they are called **zinua**. These areas are reserved for pasture, wood harvesting or bush fields (although the latter is a relatively recent occurrence). The ferruginous soils are easier to work although they have a lower fertility than sandy-argillic soils. Ferruginous soils have a low water retention capacity and dry into a very indurated form. This presents problems when preparing the fields at the start of the cropping season (although some farmers add green mulch[4] to their fields after the harvest which improves soil quality).

The lower slopes are called **nédonou** in Nuni and **bissiga** in Mooré. It is here where the Nuni have built their houses and their household and village fields. The lower slopes have a higher soil fertility but require adequate quantities of water at the beginning of the

4 Green mulching is the act of turning green vegetative matter (usually leaves) into the soil to improve soil fertility and structure.

agricultural season to mobilise soil nutrients and to allow the working of the soil. Nuni farmers distinguish sandy soils (**kasuloutia**) from argillic soils (**bounoutia**). The Mossi distinctions are **bissidagaré** and **dagaré** respectively. The Nuni have another soil type in the lower slope region called **taagatia** which is best suited to tuber cultivation, specifically yams but also sweet potatoes and cassava. **Taaga** is the Nuni word for the tree *Afzelia africana* and the name essentially means where many *A.africana* can be found growing. Therefore where many of these trees can be found growing is where it is good to plant tubers.

The lowest catenary position is the valley bottom, and is called **vwara** in Nuni (literally meaning 'valley bottom'). Here, the Nuni distinguish two soil types: **ko** which are rich in kaolinite and **tezonou** rich in montmorillonite; both of these are hydromorphic in character. The Mossi call these soils **baongo** and **kossogo** respectively. The Nuni word **bôtia** means 'near the stream' and it is here that dry season gardening takes place. Soils here have an 'A' horizon of approximately 20 cm resting on an argillic 'red' layer; the Nuni call these soils **varatia**. Next to this in the sequence is what the Nuni call **poontia** which translated means 'a piece of land with many trees'. Here are the deepest soils of the catena with a humic horizon of about 30 cm in depth.

The Nuni have additional names for other land units according to their land use capabilities. For example, **suoirè** is the Nuni word for non-exploited or bush land and **cabanô** is used for naming an old field or fallow.

Table 2.15 Nuni soil nomenclature in Lon, Boutiourou and Saboué[5]

Name of soil	Description
Bounoutia	"a sandy argillic soil with many trees and gravely soil".
Diga	"soil on the hills, very poor, grasses and trees".
Dudulutia	"one doesn't find trees here that you can find in other places, undergrowth is stunted, small and limited".
Kapafounoutia	"gravely soil, found near hills, with few trees and undergrowth".
Kapataotia	"lots of gravel, found towards Pouri going towards Cassou".
Kasuloutia	"very sandy soil, few trees and grasses, soil becomes infertile very quickly".
Petia	"some rocks, trees, e.g. Karité and *B. africana*, abundant undergrowth".
Tapuana	"a white soil".
Tesien	"a red soil".
Tezonou	"a good, black soil, many trees, almost all species and abundant undergrowth" (in Saboué it is classified as soil that is found around the houses).
Varatia	"a hard argillic soil, found in the valley bottom".

Source: Author's fieldwork, 1993-1995.

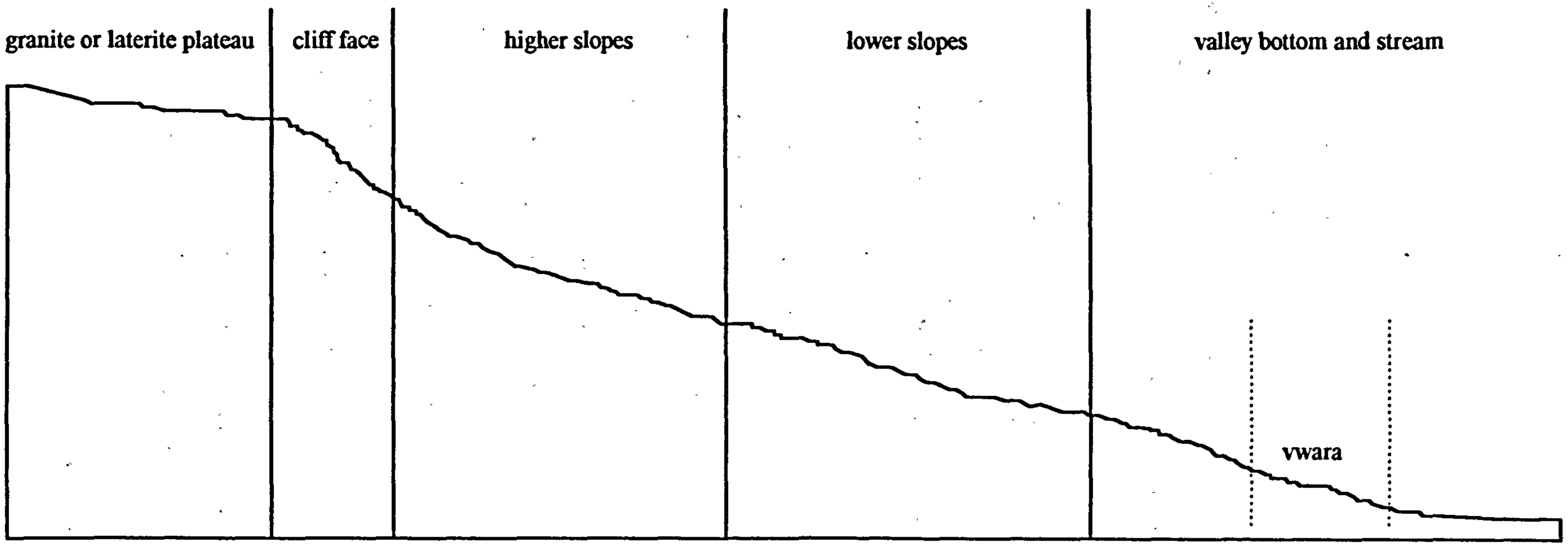
5The soil descriptions come from the Nuni elders and have not been altered.

Tekassoulou, tezounou, varatia, kasuloutia and **tagatia** are all put under cultivation by the Nuni and are all of medium to high fertility. The Nuni recognise that different soils are suited to different crops. For example **tagatia** is used for tuber production and **tekassoulou** is used for cereal production. They have a range and choice of where and what they cultivate. The land unit preferred by the Nuni is the **poontia** which has the most fertile and productive soils. Cereal cropping dominates on these areas with some cotton cultivation. Sorghum is often planted on the **bôtia** soils because of sorghum's need of water (Konaté pers.comm,1995). Groundnuts, cowpeas and bambara nuts can be grown anywhere and are often intercropped.

The Mossi however have less of a choice. The Mossi of Lon (see chapter 5) cultivate the **bissidagaré** (sandy lower slope soils) and **zinua** (upper slope ferruginous) soils. The Mossi of Boutiourou (chapter 6) cultivate on **dagaré** (argillic soils) and **baongo** (kaolinite, valley bottom soils) and the Mossi of Saboué (chapter 7) cultivate on **bissidagaré, dagaré** and **baongo** soils. The Mossi have a smaller choice of soils because land is chosen for them by the Nuni chiefs. Added to this, in the case of Boutiourou, a specific area has been designated for the Mossi. The Mossi of Saboué have wide choice of soils because they farm in an area of high land availability. However, in general, because of the poorer soils that the Mossi receive (old fallows), soil fertility management must be employed (i.e. fertiliser inputs) if productivity is not to fall.

Figure 2.7 forms one half of the catenary sequence (although the two halves are mirror images) and contains Nuni and Mossi soil classifications as well as the FAO soil classification.

Figure 2.7 Indigenous and scientific soil classification in Sissili



Nuni landform	pang		dio	nédonou	poontia	bôtia	
Nuni soil	pio (granite) diga (laterite)	dundul -utia petia	kapafounoutia	kasuloutia (sandy soils) bounoutia (argillic soils) Tagatia	ko (kaolinite) tezonou (montmorillonite) varatia		
Mossi landform			zingdongo or zinka	bissiga			
Mossi soil	tanghin (granite) kougouri (laterite)		zinua	bissidagaré (sandy soils) dagaré (argillic soils)	baongo (kaolinite) kossogo (montmorillonite)		
Scientific soil[6]	lithosols		ferruginous soils	brown soils and vertisols	vertisols	hydromorphic soils	
Landuse	hunting, wood, pasture		bush fields, land given to Mossi	village and household fields (land reserved for the Nuni)	village fields, vegetable gardens, orchards, pasture		rice paddies

Source: Author's fieldwork, 1994

6 This is the FAO International soil naming system.

2.3.5 Fuelwood

As in almost all fuelwood use situations in developing countries, the urban centres have a high influence on woody biomass stock production and depletion. The two large urban centres nearest to Sissili (Koudougou, the third biggest town and Ouagadougou, the capital) have a profound effect on provincial rural wood supplies and forest stock. The two cities have a 150 km radius of influence, covering 37 percent of Sissili.

The evolution of the urban wood market and the increasing inaccessibility of available fuelwood near to the centres of demand has made it necessary for wood suppliers to search further afield. The price of wood was fixed by the Government Circular of 15 May 1985, 570/CAPRO/MET, but is no longer respected. Now, the cost of transport, based on a truck load of wood consisting of 55 wood bundles (at a real sale price of 495,000 FCFA[7]) is estimated at a cost price of 560 FCFA/km (FAO, BKF/85/011 - this figure is based on diesel prices before devaluation, with price correction the figure becomes 715 FCFA/km). On the basis of the FAO's (corrected) calculation, and if the official price is respected, they postulate an economic distance limit of 100 km (which gives a minimum profit acceptance margin of around 25 percent with the old prices). However, now the trucks are travelling up to 135 km from Ouagadougou in search of wood[8], thus showing the increases in the sale price of wood. It is also important to note that this calculation of profit margins is likely to be an underestimation because the fixed prices of bundles is only respected in demarcated,

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7 The wood suppliers pay a fixed price of 1610 FCFA per bundle to the Ministry of Environment and Tourism. The fixed sale price was 3675 FCFA/bundle, it now stands at roughly 9000 FCFA (sold cut up in the form of faggots). If we take the fixed selling price is taken and subtracted from this the fixed buying cost of wood plus the corrected cost of transport over a 100 km distance, there is a profit of 39.7 percent (202,125 - (88,550 + 71,500) = 42,075 (26.3 percent)). If this calculation is repeated with the real selling price of 9000 fcfa/bundle there is a profit of 209.3 percent (495,000 - (88,550 + 71,500) = 334,950 (209.3 percent)).

8 In October 1994, charcoal trucks from Ouagadougou and Koudougou began coming to the department of Léo for charcoal, a distance of 220km from the capital. This development was caused by firstly the fact that charcoal is a more expensive commodity than wood and so economic distances become longer and also charcoal has a high urban demand. Charcoal trucks have just started to exploit the south of Sissili because it is rumoured that the forest of Kompienga (which was the main source of charcoal for the cities), southeast of Ouagadougou has been exhausted and charcoal production has fallen dramatically forcing charcoal merchants to search elsewhere. This has already created some resource use conflicts in the between the local populations with charcoal makers exploiting bush areas inside other villages' regions after having exhausting their own village bush zones.

managed forests. Outside these areas, 20 bundles can be negotiated from around 10/15,000 FCFA (in place of 32,200 FCFA at fixed prices). The busiest time for the sale of wood from managed forests is at the start of the rainy season when most of the wood from outside of managed forests is already sold and when travelling on roads becomes most difficult.

In the urban centres, it has been calculated that each habitant consumes around 0.5 m^3 per year, which gives an equivalent of 1.1 kg per person per day; in the rural areas the figure will be slightly higher (Agrotechnik, 1991). Using these figures, Agrotechnik (1991) has projected that in the twenty years, roughly between 300,000 to 450,000 hectares of managed forest will be necessary to sustainably cover the energy needs of the population of Sissili. If the need for agricultural land is between 0.5 and 0.7 hectares and 4 years fallow for each hectare with the need for 0.5 m^3/per/yr, then saturation level logically follows.

Table 2.16 Fuelwood consumption from managed forest areas: figures for 1990 and projections for 2000 and 2010.

Year and Population Growth - Projections of 2.5 percent, 3.6 percent and 4.3 percent	Population	Mean Consumption m^3/per/yr	Yearly Consumption m^3	Necessary Forest Area (Ha)	Percentage of Sissili
1990	300,000	0.5	150,000	181,000	13
2000 - growth rate:					
2.5 percent	385,000	0.5	192,500	232,000	17
3.6 percent	430,000	0.5	215,000	260,000	19
4.3 percent	457,000	0.5	228,500	275,000	20
2010 - growth rate:					
2.5 percent	491,000	0.5	245,500	296,000	22
3.6 percent	610,000	0.5	305,000	367,000	27
4.3 percent	700,000	0.5	350,000	422,000	31

Source: Agrotechnik, 1991.

These projections are typical of crisis narrative forecasting and, at best, have serious flaws. These figures make the common mistake of assuming that fuelwood is a single product from trees and that trees are produced to supply domestic firewood. This is a false assumption; fuelwood is a by-product of other activities, usually from the clearing of agricultural fields, i.e. fuelwood comes from off-cuts or dead trees. If there was no urban demand, the population of Sissili could supply their fuelwood needs for the foreseeable

future using the wood residue from field clearing and from gathered dead wood. However, the urban demand does pose a significant threat to woodstocks in Sissili and needs to be regulated and controlled, preferably by the local villagers themselves. FAO is supporting a number of village groups in the centre north of the province in sustainably managing their natural forests, allowing them to sell their wood to fuelwood merchants.

2.4 Pastoralism

2.4.1 Pastoralism and the Fulani

Pastoralism, and its links with overgrazing, is traditionally associated with 'crisis narratives', especially in the Sahelian region. In Sissili, there has been an examination (de Boer, 1992, de Boer and Kessler, 1994, Egging, 1990) of the impact of grazing and the presence of cattle on local vegetation and farming systems. There is little evidence that the presence of cattle in the province is negatively affecting environmental quality. If anything, cattle and the Fulani production system contribute to the strengthening of the local economy and an improvement in environmental management.

Before the arrival of the Fulani, some twenty years ago, there was little, if any, animal herding and animal husbandry was only practiced on a very small scale by the indigenous Nuni. For this reason, there exist no rules or regulations controlling access to pasture in Sissili, as there is in most of the rest of West Africa (Klintz, 1982). Water access is the most critical aspect to pastoralism in Sissili. At the end of the rainy season, pastoralists dig traditional wells in the valley bottoms, because, towards the end of the dry season, it becomes harder to find water. Visiting or passing herds must first be given permission before they can drink at these wells from the pastoralists who dug them. In times of water shortage, the well digger can refuse access, although this is rare.

Development programmes that have attempted to carry out pasture delimitation or pasture parcelling to groups of pastoralists have failed. Trying to install restrictive management regimes on previously free systems will take a long time to take effect. Because grazing routes are dictated for the most part by access to water, the key to controlling grazing

patterns must be by regulating access to water points (de Boer, 1992). Table 2.17 outlines the prices of animals on the market and demonstrates the variability of prices according to age of animal and season. The prices in the table show the considerable returns that can be gained from the sale of animals

Table 2.17 Prices of animals on the market in Léo, 1992

Animal Species	Age (years)	End of Dry Season FCFA	Rainy Season FCFA
CATTLE			
Male calf	<1	15,000	22,000
Bull (good condition)	5	42,000	70,000
Bull (medium condition)	5	32,000	37,000
Female	2	25,000	30,000
Cow	5	25,000	30,000
GOATS			
Young male/female	1	3,000	2,500
Female goat (good cond.)	>2	3,000	3,500
Female goat (med. cond.)	>2	2,000	2,500
Billygoat (good cond.)	>2	5,500	3,500
Billygoat (med. cond.)	>2	2,500	2,000
SHEEP			
Young male/female	1	3,500	4,000
Ewe (good cond.)	>2	10,000	12,500
Ewe (med. cond.)	>2	7,500	8,500
Male (good cond.)	>2	2,000	3,000
Male (med. cond.)	>2	1,500	2,700
DONKEY			
Male	3	20,000	20,000
Female	3	15,000	15,000
OTHERS			
Chicken (good cond.)	1	500	550
Chicken (med. cond.)	1	350	400
Cock (good cond.)	1	650	700
Guinea fowl (good cond.)	1	500	500
Guinea fowl (med. cond.)	1	400	400
Female Pig	3	15,000	15,000
Castrated male pig	3	20,000	20,000

Source: de Boer, 1992.

2.4.2 Pastoralism and its effects on vegetative production

Pastoralism and the presence of large numbers of cattle in the region have had certain effects on the natural vegetation, an effect that was not felt twenty years ago. Pasture is made up of many vegetative components in the pastoral year, with the herbaceous layer the most important pasture in the rainy season, providing 95 percent of fodder. In the following tables, there is a breakdown of fodder composition throughout the year, there then follows a breakdown of fodder composition by species.

Table 2.18 Fodder composition per month in the department of To, 1990-1991

Month	Annual Grasses (percent)	Perennial Grasses (percent)	Other Herbs (percent)	Woody Species (percent)	Harvest Residues (percent)
January	16	32	16	19	17
February	21	32	14	20	13
March	35	30	18	17	0
April	18	47	17	18	0
May	35	34	21	10	0
June	23	56	14	7	0
July	17	59	17	7	0
August	31	47	15	7	0
September	26	49	18	7	0
October	31	38	23	8	0
November	16	11	10	4	59
December	17	32	22	13	16

Source: adapted from de Boer, 1992.

de Boer estimates that in the department of Tô there are roughly 20,000 Livestock Units (UBT)[9] which consume 5.8 kg/day/head (Breman and de Ridder, 1991). Assuming this is consumed between May and October (the rainy season) it gives a total consumption in the department of 20 million kg of dry matter (DM) for the 6 months. Subtracting this from the total vegetative production in the department of 370 million kg/DM/yr, we are left with 350 million kg/DM accessible in the dry season. Bush fires destroys much of the DM available for fodder, thus in November only 85 million kg/DM remains and in April this falls further to leave only 25 million kg/DM (which is still a significant amount).

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9 A UBT is an imaginary animal of 250 kg: 1.5 Zebu, 10 sheep, 12 goats, 2 donkeys, 1 horse and 0.8 camel (Le Houérou and Hoste, 1977, in Breman and de Ridder, 1991); UBT is sometimes refered to as a Tropical Livestock Unit (TLU) in the English literature.

Table 2.19 Fodder composition by species for a cattle herd from Sagalo, 1992

Species	Contribution to fodder requirements (percent)	Presence in the bush (percent)
GRASSES		
Andropogon ascinodis	22	14
Andropogon gayanus	23	16
Brachiaria spp	6	4
Dactyloctenium aegyptium	4	5
Acrocera amplectus	5	1
Andropogon amplectus	3	5
Andropogon pseudrapricus	8	4
Echinochloa stagnina	3	3
Cyperus spp.	2	3
Egrostis spp.	2	2
Hyparrhenia spp.	3	1
Hackelochloa granularis	3	10
Eleusine indica	4	10
Others	12	22
OTHER HERBS		
Lantana spp.	17	4
Triumfetta lepidotha	20	4
Cochlospermum planchonii	3	2
'kionoum'	4	4
Lippia rugosa	2	1
Stylosanthes crecta	12	11
Leptadenia hastata	16	5
'gorossoukaabé'	6	1
Others	20	68
WOODY SPECIES		
Pterocarpus erinaceus	8	2
Dichrostachys cinerea	9	5
Afzelia africana	11	2
Gardenia erubescens	10	3
Acacia machrostachya	2	1
Saba senegalensis	3	3
Balanites aegyptiaca	4	4
Stereospernum kunthianum	6	1
Acacia dudgeoni	4	4
Piliostigma thonningii	7	5
Cadaba farinosa	2	0
Prosopis africana	2	1
Cassia sieberana	8	1
Khaya senegalensis	5	3
Others	19	65

Source: de Boer, 1992

Table 2.20 illustrates the dominance of the dry herbaceous layer for fodder requirements in the dry season. In the wet season, the new growth in the herbaceous layer provides the vast

majority of feed. Despite the small contribution of woody species and tree cutting to fodder requirements they are nonetheless critical in supplementing the animals diet and providing important sources of protein in a critical period of the dry season.

Table 2.20 Vegetative production for different pasture zones in million kg of dry matter, in Sissili

Pasture Zone	Nov	Dec	Jan	Feb	Mar	April	Total
Dry herbaceous layer	85.00	73.00	61.00	49.00	37.00	25.00	330.00
Woody layer	1.41	1.38	1.35	1.32	1.29	1.26	8.01
Tree cutting	-	-	1.40	1.40	1.40	1.40	5.60
Regrowth in perennial grass	-	-	0.49	0.49	0.49	0.40	1.87
Valley bottoms	0.02	0.04	0.06	0.07	0.08	0.09	0.36
Regrowth in non-burnt pasture	-	-	0.19	0.15	0.12	0.08	0.54
Cereal Residues							
Groundnut and black-eyed	-------	-------	-------	0.76	-----	-----	0.76
bean residues	-------	-------	-------	0.43	-----	-----	0.43

Source: de Boer, 1992

Bush fires destroy about 20 percent of aerial leaves on the woody species. However, herders will cut branches from certain tree species for fodder, especially *Mimosaceae spp*: *A.africana*, *Pterocarpus erinaceus*, *Khaya senegalensis* and *Stereospernum kunthianum*. Approximately 17 percent of the fodder needs of cattle between January and April comes from cut trees or bushes, contributing 1.4 million kg/DM for the 20,000 Livestock Units per year in the department of Tô (de Boer, 1992).

Regrowth from perennial grasses makes up a very important part of animal dietary requirements. The quality and the quantity of the grasses depend on the quantity of available water and the timing of the bush fire. Regrowth from perennial grasses can be divided into two classes, regrowth from non-burnt land and regrowth from burnt land. The former produces only a half of the production of the latter. A calculation of monthly recovery rates from burnt grasses is based on Geerling (1987): 0 kg/DM for a recovery of 0.2 percent, 10 kg/DM for a recovery of 2-5 percent, 25 kg/DM for 5-10 percent and 50 kg/DM for a recovery of >10 percent (see table 2.21 which uses land units from de Boer, 1992). Recovery rates on hill summits are estimated at 1.0 percent because of excessive

drainage. Again here, burnt areas have a higher productivity than non-burnt areas; 1.4 million kg/DM/ha/yr compared to 1.1 million kg/DM/ha/yr (de Boer, 1992).

Table 2.21 Recovery of perennial grasses and the percentage of burnt land in Sissili

Land Unit	Recovery percent	Early Burning (percent)	Recovery Production kg DM/ha
S	0.9	40	0
D	7.0	40	0
Sb	10.0	40	25
A	10.3	40	50
R	6.5	40	25
F	6.5	40	25
P	>10.0	17	50
B	7.5	40	25
N	0.0	0	0
C - fallow	5.0	33	10
H - fallow	5.0	33	10
b - fallow	5.0	33	10

Source: Egging, 1990.

Another source of vegetative production is found in valley bottoms, not from burning, but from the presence of water in the dry season. Crop residues also play an important role in fodder provision and the volume of crop residues varies greatly with different cropping methods. For example, with the addition of compost, one hectare of finger millet gives 3510 kg/DM/ha in residues (leaves, stems and weeds) without compost it gives 2370 kg/DM/ha. With sorghum, there is a yield of 7010 kg/DM/ha with compost, and 2790 kg/DM/ha without (Egging, 1990). Fallow land is a very important source of fodder and, depending on availability, can make up 50 percent of grazing areas.

The quality of forage is also a very important factor in animal health and production. A cow can only ingest 2.5 percent of its own body weight per day because its stomach capacity can only transform and ferment up to this percentage; this equals 5.8 kg per Livestock Unit (Dahl and Hjort, 1976). The critical factor in fodder quality is its protein content. A nitrogen content of 0.8 percent is the minimum level to allow growth, 1.0 percent guarantees growth and production. Between 0.1 percent and 0.8 percent the animal will loose weight at 0.1 kg per day, for an animal of 150 kg this represents a loss of 3 kg per month (Breman and de Ridder, 1991).

Table 2.22 Fodder calendar in Sissilli

May to September	Rainy season provides green grasses of good quality.
October	The herbaceous layer becomes dry except in valleys.
November to December	The harvest is finished and the residues become available. During this period the palatability and quality drops and the animals must search for other sources of forage.
January	At this stage the perennial grasses are very important, containing more than 1.0 percent nitrogen, bush fires also stimulate growth and leads, indirectly, to an improvement of forage quality.
February to May	Medium quality forage, many woody species eaten and other poor quality forage of difficult digestibility. At this period nitrogen content drops to 0.8 percent and below, and animals start to loose weight.

Source: de Boer, 1992.

Table 2.22 illustrates the complexity of the fodder yearly calendar. In the northern areas of Burkina Faso, significant transhumance was required to satisfy all these needs.

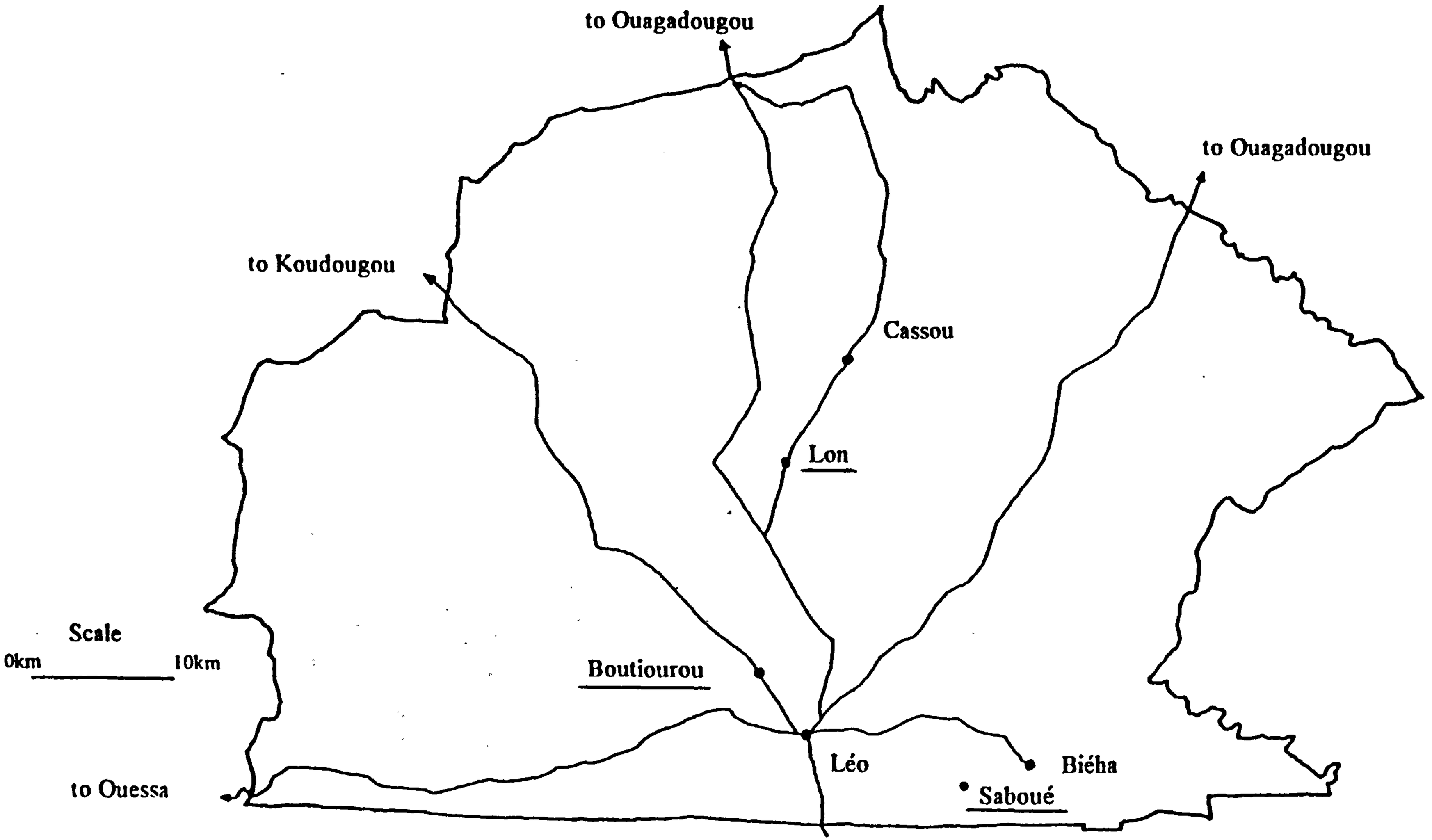
2.5 An introduction to the three case study villages

The villages are discussed in much greater detail in chapters five, six and seven. Oral histories are also provided as an introduction to each of the case study chapters. The three villages (see figure 2.8) that were chosen for this study provide a continuum in both space and time, from north to south, and from the village which has a very high number of settled immigrants, which have been there a long time, to the village which has a very small immigrant population, which has only been there a short time. There are three very different case studies presented which all, however, show significant similarities.

Lon

Lon is situated in the department of Cassou and is the most northern of the three villages. It is 43 km north of Léo, the provincial capital, and is situated in one of the most densely populated areas of Sissili. In 1985, according to the INSD census, Lon had a population of 2978. Lon has the longest history of immigrant settlements of the three villages, i.e. the immigrants arrived here long before they did in the other case-study villages. Today, the immigrant Mossi and Fulani population outnumber the original Nuni population. It also has the least productive resource base on account of its northerly location, which is compounded by competition for resources by local and immigrant population alike.

Figure 2.8 The province of Sissili showing the case study villages of Lon, Boutiourou and Saboué



Boutiourou

Boutiourou is situated 9 km to the north west of Léo, in the department of Léo. It is the 'middle' village, i.e. after Lon it has the second highest population (903 people in 1985, according to the INSD census), it has the second most productive resource base, again because of its more southerly location and Boutiourou's immigrant population have been resident, not as long as Lon, but longer than Saboué. The immigrant population of Mossi and Fulani slightly outnumbers the original Nuni population.

Saboué

Saboué is situated approximately 34 km south east of Léo in the department of Biéha and 5 km from the Ghanaian border to the south. It has a very low population of 266 (INSD, 1985) and it also has a very low immigrant population. Unlike the other villages, the original Nuni population remains in the majority over the Mossi and Fulani. Saboué also has a very productive resource base and good quality and percentage woody cover, being the most southerly of all villages.

2.6 Islam in Sissili

2.6.1 The introduction and spread of Islam

Islam has been introduced to Sissili over the last millennia by a variety of sources; travelling Imams, immigrant settlers, returning Gourounsi slaves and invaders. However, until recently, the Nuni have traditionally resisted the spread of Islam. Mosques have been built in almost every village in southern Sissili and local people that have visited Mecca are held in the highest esteem by fellow villagers calling them *Al Haji* with deference. Quite why Islam has begun to be the dominant religion in the region is debatable and is probably due to a multitude of contributing factors, not least the large Muslim immigrant population. There are two questions that are relevant to this study in relation to the arrival of Islam: how does Islam affect the economy of affection and customary law in the case study villages? And, if it does, is it positive or negative impact?

West African Islam belongs to a *Sunni* Islamic typology all of its own, mostly because West Africa's original traditional religions blends into Islamic practices. West African Islam is not the same Islam as is found in the northern Mahgreb countries and is not likely ever to be like Arabic Islam. The reason for this is the strength of the traditional Animist religions and their depth in the cultures of West Africa. Spencer-Trimingham, (1959:9) says that Animism is not an historical religion, their beliefs and rituals are founded upon a timeless mythology. Animism is also one of the central underlying forces of African society. In the absence of a central Government and its laws, Animism acts as moral guidance, judgement and punishment. Opeloye (1996) noted that the indigenous religion lays a premium on the moral order of the society; the activities of man are not left unregulated. In his study of the Yoruba ethnic group in Nigeria, he found that certain norms and codes of conduct are entrenched within their society and these facilitate the orderly maintenance of society. These formed the Yoruba's moral values, or at least contributed to their existence. Thus Animism's strength lay in its provision of the basis for customary social laws and its takeover by Islam is never likely to be complete.

In this sense, religion and society in African Animist communities cannot be separated; they are intrinsic aspects of each other. The reason for this lies in the nature of Animism and its integration of nature, divinities, ancestors (the dead) and the living. Thus all things are connected and the local production systems are as much connected to religious practices as are ceremonies and festivals. Spencer-Trimingham (1959:7) says:

> "[Their] *world is a world of spirit forces: of the dead, living and nature, among which the living form but a small minority. These forces cannot be classified into categories of good or evil, for power is essentially impersonal and neutral. If harmony is maintained, all is well, but if broken, calamity falls on individual and community".*

Islam was brought to Sissili through a mixture of peaceful and violent means, peacefully through traders, travellers and the occassional settling immigrant from the north who brought the message of Islam and often had the ability to read and write (in Arabic), and more violently through the Mossi and Djerma invasions (see chapter 4) and also through returned (or escaped) Nuni slaves who took the religions of their masters. In the midst of Nuni villages, the Islamic messages dissipated, diluted and disappeared.

Islam is not new in the province despite the fact that generally, in the three case study villages, there was a similar approximate date when the villagers said they had taken up Islam, i.e. about thirty years ago. The process of the Islamisation of traditional cultures is long and drawn out, even if respondents say they have been converted 'over-night'. Thus, in Sissili, the contact the population had with Islam over an extended period was a vital part in their conversion to Islam.

Added to this was the ability of the two religions to exist side by side. Today, one is unable to say that 'x' village is exclusively an Islamic village, and likewise it is impossible to say that a village is Animist. Strong Islamic tendencies exist in most villages in Sissili and dominate local religious practices, but there are also surviving Animist practices and beliefs. For example, there is a gradient of Islamisation corresponding to the location of the three villages, with Lon being the most heavily Islamised and Saboué the least (logically corresponding to the duration and level of immigrant contact). In Lon, there are still some old ceremonial sites, the sacred forest towards Tô for example and an 'abandoned' idol on the road to Panassin, but there are few[10] remaining ceremonies. By contrast, in Saboué, it was known that the women of the village continue to make sacrifices in front of water divinities although they profess to be Muslim. Spencer-Trimingham (1959:102) thought that this situation was an example whereby women, by maintaining old cults (i.e. participating in Animist rites), in contrast to their husbands who are predominantly Muslim, ensured that their family made the best of both worlds, Animism and Islam alike.

The point where a village can call itself an Islamic village is the result of a long process, and is as much a social as an individual matter. For example, it seems that the final determining factor for the conversion of the people of Saboué was the conversion of the chief of Pissai who then ordained that the village was now an Islamic one (and because Saboué was considered a 'suburb' of Pissai, so its inhabitants were converted). Spencer-Trimingham (1959:37) points out that when a whole family or village becomes Muslim it is not the result of the culmination of an individual's belief but the culmination point of an Islamic

10 Through the interviews it was unable to determine whether any Animist ceremonies continued as was possible in the other villages. It was suspected that this was due to the subject's sensitive nature in the light of a predominantly Muslim village.

movement within the family or village. He goes on to say that a stage is reached which is characterised by the assimilation of significant elements of Islam and the consequent parallel existence of two religions in the community.

This parallel existence of both religions is often hidden or unseen to the observer. In none of the villages, with perhaps the exception of Saboué where some respondents admitted to being half Muslim and others to being Animist, was there an admittance of being half Muslim and half Animist. In Lon and Boutiourou, there was an unwillingness to talk about Animist practices, either old or current. There Islam was synonymous with 'civilized' and their old Animist ceremonial sites were neglected and left to ruin. As Opeloye (1996) points out that commonly, the material symbols of the dying cult are not destroyed but simply neglected, for example ancestors' houses gradually disintegrate under the wind and rain, as was the case in Boutiourou where the old Animist village site has been left to ruin.

In relation to the impact of Islam on the traditional economy there are some indicators that may either suggest a future weakening of traditional customary law or conversely may lend a religious complementarity. For example, there is now in Lon and Boutiourou a religious leader, who in the case of Lon is a Mossi and Boutiourou a Nuni, of high social standing. Islam may have brought a pacifying influence on the three ethnic groups, being the common religion. The Friday prayers bringing the communities together in unity, gathering over a common spiritual goal, as the elders say, "*Maintenant nous prions ensemble*[11]".

2.6.2 Why it fitted so well to Nuni life

The attraction of Islam to West African communities is due, in part, to the complementarity of Islam to Animism and the fact that Islam did not immediately demand a total break from the traditional religion. Also, the two religions share many things in common, or perhaps more accurately, Islam has the ability to lend itself in whatever shape or form, so as to incorporate many aspects of the original religion. For example, the process of Islamisation adopts the way of myth and fable, and 'the custom' acquires a new supernatural sanction;

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11 "Now, we pray together".

no longer is it practiced because it was the custom of the ancestors, but because God ordained it (Spencer-Trimingham, 1959:41). In this way the two religions exist side by side.

The Mossi, Nuni and Fulani join together in the mosque and thus affirm each individual's sense of belonging and communality. Likewise, the Islamic practice of alms giving, complements perfectly the local gift-giving support networks and can be said to fit in to the local economy of affection. Either Islamic alms giving is a guise under which to place existing support practices, or it replaces traditional 'gift giving' and places it in a quasi-religious framework; half Islamic, half traditional. Mauss (1966:16) says "it [alms] is the old gift morality raised to the position of a principle of justice"[12]. He goes on to say that alms are the result, on the one hand, of a moral idea about gifts and wealth and on the other of an idea about sacrifice. Adams (1993:44) similarly notes; "Animist practices such as homage paid to ancestral priests for good fortune in farming, coexist with or have even transformed Islamic almsgiving and charity to the destitute"[13]. The two religions blend and complement each other.

Opeloye (1996:85) identifies similar characteristics of Islam which made it favourable to the Yoruba, he says "the Islamic institutions of polygyny, impressive Islamic festivals, the [Imam's] use of talismans, charms and divinations to offer protection were liked by the people because these met their social and spiritual needs". Opeloye (1996) also identified that Islam, just like Animism, lays down detailed regulations to guide people in all their activities, both spiritual and material; the Islamic superstructure consequently rests on faith, ritual observances and transactions.

However, there were contradictory aspects to Islam that were attractive to local communities. Although Islam is a religion shared by the whole community and as such brings a sense of belonging to the greater population, it is also an individualistic religion. For example, Islamic law is *ad personam*, in opposition to the direction of traditional African law which is communalistic (Spencer-Trimingham, 1959:125) and, as such, Islam

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12 Mauss (1966) noted that originally the Arabic *Sadaka* meant exclusively justice, but it later came to mean alms.

13 Islamic law requires that 10 percent of annual production or income, be distributed among the old, infirm and the destitute (Adams, 1993). This practice is called *zakkat* in Arabic.

accords the liberty that is so popular, especially amongst the younger age groups in Sissili. Hence the common response of 'under Islam we are more free'. Certainly , in the case study villages, there is a heightened feeling of freedom under Islam which can be at least partly attributable to the slackening of the strong social hierarchies that existed under Animism.

It seems that it is an astute economic decision to become a Muslim. Animism required high levels of individual contributions to communal events and festivals. In the case of funerals, they lasted three days for a man and four days for a woman. People were buried in a sitting position; corpses is Islamic burials are buried lying down. Each person was expected to bring along animals, grain and beer for the period of mourning. Now funerals only last a day regardless of sex. People were also expected to make regular animal sacrifices before idols on particular days in the agricultural calendar, at field preparation time, seeding and harvest. These were both individual and communal events; communal in the village ceremonial site led by the land chief, and individual in home or field. In short, many animals and gift 'tokens' had to be laid out every year. In times of sickness or hardship, again animals would be sacrificed in front of idols. Now, people simply pray to Allah.

Connected to this greater freedom, are the changing agricultural practices. Because Animism is a strong earth religion, it had many codes which were characterized by set rituals in the agricultural calendar. Now however, these ceremonies have disappeared from communal practices. As Spencer-Trimingham notes (1959:38) "adoption of the Islamic lunar calendar has ... led to changes in the ritual cycle of the agricultural year and the family rites change to Islamic fertility rites". At present there is a lack of data on the subject to say what implications this has on land management practices, but it may see another form of 'individualization'[14] of village life.

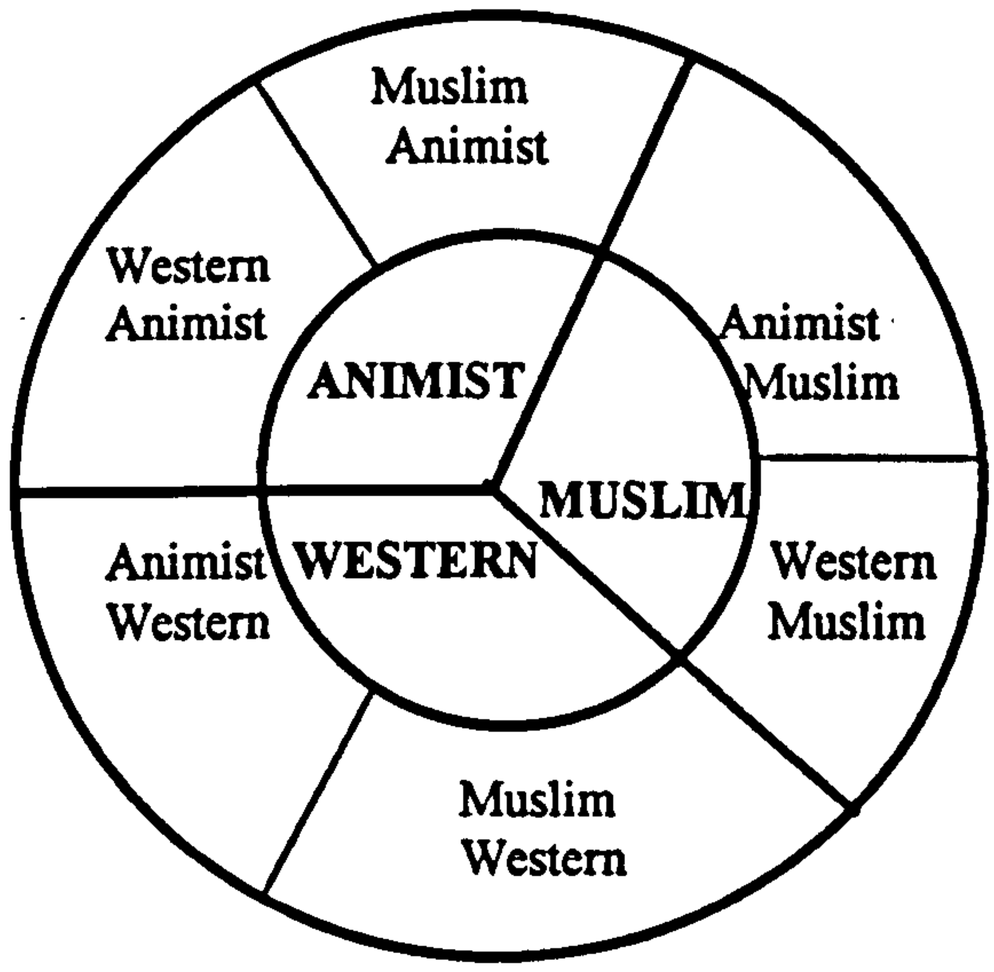
2.6.3 Animist Muslims

Neither Islam nor Animism is a religion in the western sense, i.e. it is not a weekend religion that can be practiced in a definite time and space. It is truly a way of life. Below is a

14 This is not to say a disappearance of community or communal life but moreover a greater freedom of choice enjoyed by the individual on the type of crop or cultivation method employed.

schematic representation of the interrelationships between three parent cultures which qualify, modify and condition each other.

Figure 2.9 The range of religious mixes; Animist, Western and Muslim



Source: Spencer Trimingham (1959)

The segment which best describes the situation in southern Burkina Faso is the Muslim Animist. Opeloye (1996) identifies the elements of Animism as existing in Islam as: dynamism, spiritualism, cultism, magico-religious practices, ceremonies associated with the Islamic institutions of circumcision, marriage and death. In these cases it is common for the local customs to hold their ground against the total takeover of Islam and Islamic law.

The reason that there is not a total takeover is because of the foundations that the villages have in communities based on kinship, culture and territory. The communities in Sissili are also not static but they are guaranteed cultural and social stability by the fact that they are essentially agricultural. Therefore, their links with the land provide an anchor which can then be attached to a belief system that suits the community at whatever level of *melange* that is appropriate. Because of this, when Islam is adopted, the community does not suddenly change its social pattern but remains a unity distinguished by its own pattern of custom (Spencer-Trimingham, 1959:125). Therefore, in Sissili, Islam has become closely entwined with communal life yet without disintegrating its basic structure.

It seems that people prefer Islam to their old Animist ways. Animism had a very strict code of living with many 'thou shalt nots'. For example, it was forbidden to have sexual relations in the bush or spill blood. Animist laws also decreed certain areas where it was forbidden to fish or farm or burn the bush. Presently villagers feel they are free to do whatever they want. One elder said:

> "*Islam arrived 30 years ago and said that God is unique, while Animism considered all idols as Gods. We had to give all the time to the idols before while those who practice Islam live better; they follow the rhythm of civilisation*".

Animist traditions still exist and Islam has by no means taken total control of the villagers' 'Animist psyche'. The most obvious untouched traditions are the presence of the land chief, village chief and (if present) the village counsellor. The land chief is still considered to be the link between the supernatural and natural world, between men and spirits. There are also sacred sites that still exist where it remains forbidden to fish, farm or hunt, for the Mossi in particular. The Animist fetish has also been given some validity as a 'die-hard' tradition by the Imams, mostly due to the worn fetish (i.e. charm or amulet) occupying a central position in Animist practices. Now instead of putting animal parchment or bones, blood or feathers as charms against evil, bad health and poverty, verses of the Koran are written out on paper and wrapped in leather and worn on the person. However, there are still particular people in particular villages in Sissili who still make 'medicine' (or **wac** in northern Ghana), i.e. powerful Animist fetishes and charms that are thought to have the ability to curse or kill. In this sense Islam has not 'killed' the belief in Animism, but simply replaced the practice of Animism; there still remains a firm belief in Animist powers as can be seen in the use of Animism in the preparation of homeopathic medicines (see Howorth and Konaté, 1995).

As Animism is an 'earth' religion, in that its spirituality is a result of man's relationship with the natural world, with their fecundity relating to the land's and *vice versa* (e.g. it is best for fertile women to sow the crops), it follows that the Animist yearly ceremonial timetable served the purpose of strengthening management of the land and water. For example, at the appropriate time the land chief would begin the 'bush burning' ceremony which calls all people to burn the bush at a particular time, not earlier or later, or the hunting festival which would signal the start

of the hunting season. These events were management tools aimed at maximizing production for all and keeping a balance on exploitation levels. The Muslim feels freer than the Animist, at liberty to act as they see fit, free from many of the obligations of gift giving and convinced of their modernity being converts to the 'new religion' of Islam. However, customary law mechanisms still maintain control over issues of resource use and exploitation.

2.7 Summary

This chapter has illustrated the complexity of the provincial production systems and its relation to the local environment. There has been a number of critical changes to the indigenous production systems, including new ethnic groups, new language and new religion, and as such the province will never experience the same conditions that existed before immigration. However, far from experiencing environmental destruction and degradation, the three ethnic groups are in the process of negotiating new resource use patterns and forming new lifescapes. The objective of the research is to understand this process of change and its implications for local management of natural resources. It is necessary to examine the social, historical and ecological makeup of the local environment, expressed in local terms, in order to understand how people manage their environments. The following chapter explains how this was done.

3. METHODOLOGY

Chapter overview

This chapter presents the methodological approach to the research and its ideological underpinnings of participation and empowerment. Firstly, the chapter is introduced (3.1) with a short description of the present problems facing rural development methodologies. This is followed by an introduction of ADESSI, the NGO, (3.2) and its projects. Section 3.3 describes the core experience of working in a different language and culture and also explains the choice of the case study villages. Section 3.4 to 3.7 discuss Participatory Rural Appraisal and farming systems research techniques and the theory behind them, as well as discussing their limitations. The problems experienced in the research are given in 3.8 which is followed by a description of how the results are presented in the text (3.9). Section 3.10 summarises the chapter.

3.1 Introduction: methods from madness

"*If scientists are trained to try to squeeze their understanding into simple cause-effect relationships, they will lose the ability to listen to and use the 'thick description' which emerges over a bottle of rice wine shared with a farmer*" (Christoplos, 1995:34)

The crisis of development is manifested in the present crisis of methodology. It is a crisis in the traditional thought systems of positivist development methods. But, it is an important crisis because it opens up the debate on appropriate research for appropriate development. At present there are no 'right' ways to go about research and development, rather there are 'toolboxes' of methods that can be used depending on the local situation and how the researcher judges their appropriateness. There is no longer a sense of the objectivity of

methodologies in determining rural African truths; now subjectivity is an accepted part of the tool box: you are the best tool in research ... use your own best judgement (Chambers, 1994).

The issues raised in the paragraph above are discussed in detail in this chapter. Also discussed in detail is how my methodology was developed over a period of two years in the field in the context of a rural development project. A major difference of this study to many other research reports is that the research (and the methodology) was developed while being involved with development activities with the study groups. "Whereas development projects gather information specifically to inform their ensuing activities, research (and particularly small scale Ph.D. research) is much less action oriented" (Schreckenberg, 1996: 119). In my case the research included development (R&D) and was action oriented.

3.2 The rural development project

3.2.1 Introduction to the project

In this section, the rural development project and the NGO are introduced. This is in the methodology because the quality of the data collected was made possible through working with the NGO and the relationships I established with the farmers' groups. Thus, working for an African NGO was intrinsic to the nature of the research.

In late 1992, the United Nations Association for International Service (UNAIS) advertised the post of agroforester for an African NGO in southern Burkina Faso, for which I applied and subsequently was offered the post. UNAIS is a British NGO of charitable status that is affiliated with the United Nations. It recruits qualified and experienced people to work for a minimum of two years in community based projects in the Third World (UNAIS, 1991). UNAIS works in Bolivia, Peru, Palestine (the West Bank and Gaza Strip), Mali and Burkina Faso. It responds to requests by local organisations, with which it has links, for technical assistants, which UNAIS attempts to find. The technical assistants are employed by the local organisation, UNAIS are simply the fund raisers.

3.2.2 L'Association pour le Développement Economique et Social de la Sissili (ADESSI)

The Association pour le Développement Economique et Social de la Sissili (ADESSI) has its origins in the Association pour le Développement Economique et Social de Nuna Lo[1] (ADES Nuna Lo). ADES Nouna Lo was founded in 1976 by a group of Nuni civil servants and professionals who live in the capital, Ouagadougou. The organisation was established in response to the pressures placed on the region during and following the severe droughts of the 1970s.

The principal objective of the association at the time it was established was to reduce the suffering of the local population, both immigrant and resident. Consequently, the emphasis was on specific, short term projects in areas such as medical provision, the construction and rehabilitation of schools, cereal banks and boreholes. In February 1988, the organisation redefined its aims and objectives in order to focus on long-term, grassroots development initiatives, involving the full participation of the region's rural population. At this time ADES Nuna Lo changed its name to ADESSI.

3.2.3 Staffing, structure and administration

ADESSI had five levels of administration. Firstly, the General Assembly which is made up of representatives from each of the departmental committees (see below) within the province and also of external committees (from outside of the province) and village group members. The General Assembly meets once a year in Léo at which time the staff of the executive committee, the second level of administration, are approved by the assembly for the coming year.

The Executive Committee (*Conseil d'Administration*) which is based in Ouagadougou, is made up of the following office holders:

1. President

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[1] 'Nuna' is a collective term for the Nuni and '**Lo**' means country in Nuni, thus the land or country of the Nuna.

2. Vice president
3. Director of finance
4. Auditor
5. Secretary
6. Joint secretary
7. Publicity officer.

The Provincial Co-ordination Committee constitute the third level and is based in Léo. There are five members of the Provincial Co-ordination Committee including a general secretary. Their role is to direct project activities at the provincial level.

The fourth level of administration, the departmental committees, exist only on paper. There should be a departmental committee in each of the 13 departments in Sissili and they should number six representatives. In principal, this committee should elaborate development plans for the department. ADESSI has attempted to create these committees but, because of a lack of funding to execute projects in each department, the committees soon became redundant.

The final level of administration are the village groups with which ADESSI work.

3.2.4 Aims and objectives

The principal aim of the association is the improvement of the conditions and quality of life of the people of the province of Sissili. The goals inscribed in the statute of the organisation are:

1. to realise projects within the political economic development framework defined by the Government of Burkina Faso; and
2. to research sources of finance for the realisation of integrated development in the economic, social, cultural and educational domains.

More specifically the association has the roles of: the '*sensibilisation*'[2], organisation and the mobilisation of the population around problems and development programmes (with a special emphasis on women); the identification of needs; the elaboration of projects with the local people; and the research and mobilisation of financial resources (local and external) in the following domains,

- agriculture and animal husbandry,
- health,
- village water supplies,
- education and culture,
- reforestation,
- training,
- equipment, saving and credit.

3.2.5 ADESSI's *raison d'être*

In order to understand ADESSI's rationale for existing it is necessary to understand the links between rural and urban centres in West Africa. Various people have commented on the absence of an urban proletariat in East and West Africa (Eklan, 1960, Hyden, 1986) (this is not the case in Southern Africa) and the African urban area's inability to foster new social classes or processes. What has happened with the increasing rural to urban migration trends in many African cities, is the increasing ruralisation of cities. Indeed, Ouagadougou is often referred to as a '*grande village*[3]' by residents and expatriates. What this means is that forms of social interaction and modes of conducting business increasingly reflect indigenous (originally rural) practices (Hyden, 1986).

One of the basic premises of the economy of affection is that profits are distributed throughout the earner's kinship network. Consequently, there is a net flow of resources and money from the urban to the rural area through remittances. These investments from the urban to rural serve the purpose of maintaining social networks or, more directly, through

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[2] 'Sensibilisation' is a French word and translates into 'making people sensitised or aware'.
[3] 'big village'.

investing in rural agriculture or infrastructure, such as houses, bars, hotels or restaurants. These transfers take place in two separate contexts: either through a single family unit, where the male works in the city and his family reside in the rural areas; and with community based networks, with some that are officially registered as welfare or improvement associations and others being ad hoc groups mobilised for a specific event or project (Hyden, 1986), such as ADESSI.

ADESSI came into existence through its welfare role after the large scale immigration into Sissili from the north. It then transformed its mandate from a welfare to a development NGO. In both its forms, it is a vessel through which its Nuni members can send remittances back to their places of origin and their already established social networks. Through this strengthening of their social networks they are assuring their own welfare in old age. It has been shown (Sauerborn *et al*, 1996) that the more wealthy rural households tend to receive more gifts, free labour or aid in times of crisis than the poorer sectors of society. This explains the often seemingly bizarre choice of villages to site development activities; often one finds that the uncle of the president of the NGO lives there or the brother of the secretary.

Individual members of ADESSI also transfer remittances back to their respective rural areas in Sissili. Many individuals are building houses, bars, restaurants and one member has plans for a hotel in Léo. In addition to this, some members have their own yam fields and cotton farms for generating additional income. Two members have bought 'transporters' that buy and sell produce at the large Sunday market in Léo and provide taxi services between the capital and Léo. This level of remittance transfer is encouraged through the early age of retirement in Burkina Faso (and in other African countries) of 55, encouraging investment in alternative businesses or money making enterprises for their post-employment period. ADESSI is there to help themselves and their broader social networks. This is no bad thing as money and development activities are channelled through these social networks to the needy.

3.2.6 The projects of ADESSI

At the time of my arrival, in 1993, ADESSI was running two projects: a women's development project and an agroforestry project. The women's development project (*Programme pour le Développement Integré pour la Promotion des Femmes dans la Province de la Sissili* - PDIPF) began in 1993 and worked in three areas; the provision of credit to womens' groups for developing small commerce; the provision of grinding mills through a policy of part donation - part credit; and supporting dry season gardening activities through purchase sharing (i.e. the women's group had to share the purchasing costs of the materials). The first phase of the agroforestry project (*Projet Agroforestier*) was funded by *Reseau Afrique 2000* (a programme of the UNDP) began in 1991 and ended in 1993 on my arrival. The objectives of the first phase of the project were:

1. the protection of the local environment and ecosystem;
2. the training of villagers in soil management;
3. soil improvement and nitrogen fixation;
4. soil and water conservation;
5. the improvement of the socio-economic conditions of the local population;
6. educational exchanges/interaction between different villages and areas.

To achieve these objectives, ADESSI attempted to create three departmental village nurseries situated in the villages of Sagalo (in the department of Léo), Yelbouga (in the department of Biéha) and Lon (in the department of Cassou). At the time of implementation, ADESSI had no technical staff on the ground to oversee project activities and so decided to hire local technical staff from *le Service Provincial de l'Environnement et du Tourisme* (SPET) based in Léo. This relationship proved problematic because of insufficient supervision of the hired technical staff from members of ADESSI stationed in Ouagadougou and an uncertainty of the hired staff of the project goals. ADESSI also proved to be over-ambitious with the nurseries' production levels of 100,000 tree seedlings per season. It has been demonstrated by a wealth of examples that centralised, large scale nurseries, aiming to be supply centres for the surrounding areas, rarely work because of a lack of involvement of the local people (O'Keefe and Gelder, 1995). At the end of the first two years of the project,

less than one percent of the total seedling production in all the nurseries were planted and it is unsure if those planted survived the first season. The nurseries failed because:

- they were 'top-down' decisions, few discussions with the village groups had been undertaken and the villagers were 'told' what to do;
- nursery workers were employed and paid by ADESSI so there was little involvement by the village groups in nursery activities;
- lack of access to the villages and lack of perceived need by the departmental population meant that the nurseries failed to supply the departmental population with tree seedlings;
- in two of the villages the nurseries exacerbated village conflicts between two opposing cantons because it was not clear who 'owned' (i.e. had responsibility) for the nurseries;
- after the nursery workers contracts had finished, the nurseries went into disrepair;
- in two of the villages water in the wells became a limiting factor;
- in two of the villages the communal nursery materials were used for private use and consequently caused additional conflicts.

In 1993, on my arrival, one of the first tasks was an attempt at the rehabilitation of the three nurseries. It was decided after three months of attempting their rehabilitation that only one of the nurseries (at the village of Lon) could be continued, and this should take the form of a '*jardin polyvalent*' (a mixed garden with vegetables, fruit trees and a tree nursery).

Together with the members of ADESSI, the aims, approaches and objectives of their agroforestry programme were rethought and reworked. The result was a village tree nursery programme that would be based around a needs assessment exercise with a participatory approach to agroforestry development. After exploratory participatory appraisals with village groups in Sissili, the objectives of the second phase of ADESSI's agroforestry programme included:

- to increase agricultural production through the integration of agroforestry techniques in the local farming systems;
- to improve the nutritional status of local communities (especially women and children) through fruit and vegetable production through dry season gardens;

- to take the pressure off local forest resources through the management of planted woodlots for fuelwood, medicine, building poles and food;
- to create self-sustaining village tree nurseries to provide local communities with access to tree seedlings and as an income generating activity;
- to heighten the awareness of local communities of environmental issues in their own local production systems.

Below is an overview of the core experience gained during the project.

3.3 Project experience

3.3.1 Core experience

My initial period (familiarisation) was spent touring the area with my counterpart, as my trainee and translator, talking to local leaders and local groups, picking up snippets of local greetings and names, looking at existing production patterns and environmental configurations. The next phase was to facilitate participatory appraisal sessions with the local communities. This formed part of the needs assessment that was carried out to identify 'working groups'. Here, through a social process, their needs and wants were articulated and their problems and proposed solutions were offered. Throughout this participatory process, it became clear that there were different groups involved, different stakeholders. These included women's groups, men's groups and youth groups who all had different interests. It also became apparent that there were tribal differences; some groups were of mixed ethnicity, some were only of one ethnic group. Added to this, each ethnic group had their own particular needs; the herders were interested in trees for cattle fodder, the Mossi were interested in compost pits, and the Nuni wanted mango trees. There were also very important questions of organisation and project management, on areas such as nursery management, management of revenue, supervision and upkeep of the trees and soil and water conservation structures.

This diverse social and ethnic background offered a range of different issues and it was clear that project success involved more than improved technologies. The social process of

negotiation, discussion and conflict resolution was central to the success of the work in the villages. It became clear that, in order to understand local production strategies there had to be an understanding of local social and cultural systems.

Understanding of local social systems was achieved through a process of participatory appraisal and intense and prolonged dialogue between myself and the local communities. The project worked through talking about the problems and opportunities of the production system in a patient and an open manner in the context of a motivated and dynamic community group. Throughout the two year period, it became apparent that the lack of dialogue between rural development workers and farmers (local communities) was the main failure of centrally sponsored development projects (i.e. Government projects); they did not have the time, resources or willingness to engage in this level of contact, communication and dialogue. Working for a local NGO, I had the time, resources and understanding that, if project success was the desired end result, this was the necessary approach. To understand the social process was to direct local action. Therefore, the conclusion was that, for project success it was the social and not technical understanding that produced results.

There were a range of project activities that were implemented with the village groups over the two year period. These included: approximately 60,000 trees planted; 13 village nurseries set-up; approximately 10 km of windbreaks planted; 10 wells dug; 5 dry season gardens put under cultivation; approximately 10 km of erosion control bunds constructed; 100 compost pits dug; 15 communal orchards planted; 13 group 'running funds' set-up (village group funds); 13 village demonstration farms operationalised; and a number of natural, organic pesticides introduced. All these activities were carried out by the local village groups (men's, women's, and youth groups) with myself and my counterpart facilitating the process; providing training, credit, small materials, inter-village visits, study tours, literacy training and facilitating meetings. Below is a summary of the project activities carried out in the three case-study villages.

Lon

Lon was one of the three initial villages in ADESSI's first phase of agroforestry activities (funded by *Reseau Afrique 2000*) and was the only village which wanted to carry on agroforestry activities. Lon already had materials that had been installed in the first phase, these included 200 metres of metal fencing which enclosed half a hectare, a wide diameter well and various garden tools. On arrival, numerous discussions were held with the men's and women's village groups (both of mixed ethnicity, with a small number of Fulani men but no women) to determine how they felt about the previous two years work. It came to light that they had little involvement and were not consulted about tree nursery or agroforestry activities and any involvement they had was simply to plant the trees that were produced for them in already designated areas. After funding had finished and the paid nursery worker had left they were unsure what to do with the remaining materials. They thought it was ADESSI's nursery. It was explained during the meetings that the materials were there for them to use as they saw fit. After a number of meetings it was clear that they wanted to initiate agroforestry and dry season gardening (in the form of a *jardin polyvalent*) with the collaboration of ADESSI, as they saw a need in the village for tree products and vegetables. The main problem however, was the lack of water in the well, which needed to be deepened if activities were to be started. Once this was completed, with the villagers and a technician who used dynamite to blast through rock layers, tree seedling and vegetable production began. The vegetables produced were used by the village group (which was an amalgamation of the women's and men's group) and any surplus was sold with the profits going directly into the group's coffers. The tree seedlings were used in the *jardin polyvalent* for hedging, fruit production and poles; small group woodlots were planted. Some agroforestry experiments in the men's experimental field were carried out and the remaining trees were sold to other villagers and passers-by, with the profits going to the group. Their *jardin polyvalent* was at once a food producing area, a focal point for group activities and the production point for new agricultural techniques.

Boutiourou

Boutiourou was one of the villages that was identified during the initial needs assessment exercise and the men's group was known to have wanted to start agroforestry activities. The men's group of Boutiourou were already involved in the *Gestion de Terroirs* project of the *Sixiéme* FED, which involved agricultural credit, the building of a dam and the sinking of wells in the village. The group (which included Mossi and Nuni) was known to be very dynamic. Through a series of village meetings, they elucidated their needs in relation to trees. These included fruit trees, trees for poles, medicine and fencing and agroforestry species. It was decided that ADESSI would loan the group the materials for the installation of a village micro-nursery with a capacity of about 5,000 trees per season. Materials included 40 metres of fencing, garden tools and two empty oil drums. The nursery was installed next to the village borehole to resolve the problem of water shortage. Each morning the nursery workers would fill the drums so as not to interfere with normal water collecting activities of the women of the village. At the end of the first season, the village group had planted a two hectare woodlot, planted a hedge around their nursery and extended its size, carried out a number of agroforestry activities in the experimental field, decorated the village central zone with ornamental trees; sold a significant number of the trees remaining and the profits went into a running fund for the nursery. The nursery provided a production point for high utility trees, the introduction of new experimental agroforestry techniques and a focal point for the village as it was situated next to the main water point.

Saboué

Saboué was another village that was identified through the needs assessment exercise but this time it was a Nuni women's group that had expressed the desire to initiate development activities. Through the meetings, it was apparent that the women's group had already been trying dry season gardening activities near the valley bottom but had suffered from wandering animals, insect attack, flood and other problems. It was decided together that fencing and a permanent water source was needed, as well as training in gardening techniques. 200 metres of fencing was provided, which the group contributed 20 percent of the cost and a well was installed, to which the men of the village dug. The women also

expressed the desire to start a tree nursery to produce fruit trees, trees for medicine, thorny hedges, food and poles. At the end of the first season, the women's group had planted a mango orchard, surrounded their garden with thorny bushes (with the objective that when the thorny bushes have formed enough of a hedge, the metal fencing can be removed to be used for other activities), and created a multi-storey aspect to their garden with fruit and food trees. The *jardin polyvalent* provides a significant source of food in the dry season and a place for technical training and is a focal point for discussions and meetings.

3.3.2 The linguistic environment

The methodologies examined in this chapter were employed in a diverse linguistic environment. The first precondition to both work and carry out research was to learn French, as Burkina Faso is an ex-French colony. This was done through a one month intensive French course in Bobo-Dioulasso in southern Burkina Faso, paid for by UNAIS, then an immersion in the local society of Léo where I lived, where most people spoke French. The three tribes have separate languages: Nuni, Mooré and Fulfulbé. Work and research in the villages was made possible through my counterpart, Mr Oumarou Konaté, who spoke the three local languages, and with whom I communicated in French. As each language has its own nuances and intricacies, it is only through the skill of translation by my counterpart that I was able to work and research effectively through my two year stay. After mastering French, I was then able to concentrate in learning the essential (lengthy) greetings in each of the local languages and the names for crops, trees and other crucial resources. This was important as an initial 'ice-breaker' to new people I met or to create a good atmosphere when carrying out joint or individual meetings.

3.3.3 Choice of the villages

It was felt necessary to choose three case study villages and to include these case studies, in the form of chapters, in the main body of this thesis to provide the thick description needed for an examination of the local management of natural resources. The villages of Lon, Boutiourou and Saboué were chosen for a number a reasons. Firstly, they were chosen because of their spatial positioning. Lon is situated in the middle centre of the province which has a highest and oldest immigrant population with the poorest natural resources, Boutiourou is situated near to Léo with

the second highest and oldest immigrant population and the second best natural resource makeup, and Saboué is situated furthest south with a very low immigrant population and very good natural resources. All the villages also have different histories which manifest themselves in different customary management arrangements. All the villages are very different from one another whilst containing the same three ethnic groups. It was felt that examining the variation in time as well as space, was the closest to a scientific experiment as could be achieved, given the complex social histories in existence in the village setting. These specific villages were chosen because they were areas where I had been working (therefore overcoming the main problem of PRA) and thus I already had a good relationship with the village groups.

The level of analysis, because of the latter, was the group. More specifically, the analysis concentrated at the different ethnic groups within the different villages and an examination of their processes in relation to each other and their landscapes (lifescapes).

3.4 Participatory Rural Appraisal and the research methods

The research methodology has its basis in Participatory Rural Appraisal (PRA) techniques but goes above and beyond this to employ deeper anthropological and ethnological methods. It is thus a mixture of participatory methodologies and social analysis. These techniques are then all founded in a working relationship between the farming communities and myself that spanned over two years, in the context of a sustainable land-use project. In a sense, the research and the project-work are difficult to separate because of the nature of the participatory methodologies employed. As Slocum *et al* (1995) explain participatory methodologies identify issues for both the researcher/facilitator and the community, and offer tools which are formulated, operationalized and tested in rural settings. Such an approach can assist long-term capacity building and empowerment for development agencies, local communities, and the individuals, households and institutions within those communities (Slocum *et al*, 1995).

Participatory research developed, as a project planning tool, in the 1970s, "with the radical goal of empowering people to fight oppression and claim the choices that were denied them" (Guijt and Cornwall, 1995:3). It grew out of direct multidisciplinary field experience, mostly in developing countries, and not, like most other research methodologies, in northern academic

institutions. Scoones, (1995:18), notes that because of the absence of a conventional disciplinary perspective, PRA has been considered unrigorous and unpublishable, and the experimental and interactive nature of PRA has been sensed as threatening by some academics. It was developed as the first research method that was led by the beneficiary group, and not by the outside agency. After Scoones, (1995:17-18), PRA has several major characteristics:

- the processes of participatory research are slow and difficult;
- the techniques of PRA are complex and require many other skills, especially of communication, facilitation and negotiation;
- wider issues of organisational change, management systems, ethics and responsibilities also need to be addressed when using PRA;
- PRA is based on an action-research approach, in which theory and practice are constantly challenged through experience, reflection and learning.

Despite the difficulty in using PRA techniques, they were necessary because, as Richards, (1995:14), points out "understanding the dilemmas of the rural poor is extremely difficult because they lead extremely complex lives".

The added facet to the PRA techniques employed are the ethnology and anthropological aspects. These combined aspects were needed to understand the context of the local realities and especially in relation to the distinct cultural identities of the three ethnic groups. No formal methods (although Scoones, 1995:19, points out that anthropology is not about methods) were used, but the religious and cultural dimensions to the research topic were given full attention. The ethnographical information was gathered in the form of oral histories from male and female village elders. Ultimately, the goal is to try to understand local realities in local terms (Cornwall and Fleming, 1995:9). Richards, (1995:15), highlights the danger of not doing this,

> *"Put explicitly, what kind of muddle are we in if one set of participants - the organisers, holds the view that the farm calendar being plotted on the flip chart is a template for agricultural action, and the other group - the rural poor (sic) - sees it as an outcome of what they do?"*

PRA needs anthropology (and ethnography) to continue the process of reflection, self-critique and theoretical and methodological enrichment (Scoones, 1995:19).

One of the main weaknesses of PRA techniques is that they can become damaging to local communities if used purely as a research exercise with no action attached to them. Hence, the need for the often coined term, 'action-oriented research'. This is because of the time consuming nature of PRA and the commitment needed from the communities or individuals involved. PRA is about needs identification and problem resolution at a fundamental level. If no action is taken on the communities recommendations, the groups involved become demoralised and demotivated. As Schrekenberg (1996:119) honestly points out why she did not use PRA (but used RRA[4] instead) in her research: "The PRA emphasis on villager participation and control of the research process and of the results would inevitably have raised many expectations, which I was in no position to fulfil". This problem however, was overcome by the nature of the research/action that spanned over two years. The PRA complemented the project work with the communities and vica versa. The communities were happy to invest in the research process because it was, for them, a means to an end: to improve the land-use system in their village territory. By articulating their local situation it enabled them to contextualize the problems and create solutions. This action-oriented research, even if it was not specifically focused, for example on the agricultural system but on the social system, contributes to the overall goal of ADESSI's project because it forms part of the whole production-system reality. Thus, it increases the knowledge base of all the actors involved and strengthens the worker-village group relationship.

PRA techniques and anthropology/ethnography approaches were used throughout the two year period. However, they can be said to have been formally employed after an initial period of three months. The first three months were used for familiarisation between myself and the village communities were I worked. This period consisted of regular weekly visits to each village, talking to elders and members of the community, introducing myself, tours of the village territory and learning essential phrases in the local language. This was a period of observation and acquaintance for both myself and the local communities where I introduced myself into the social fabric of the communities. This was crucial because, as Hyden (1980:6) points out, there are

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[4] An examination of the relationship between RRA and PRA is not offered in this study (instead see Critical reflections from practice, PLA Notes, No.24, IIED) however, RRA is an extractive process characterised by a researcher collecting information which is analysed externally from the community in question, whereas PRA is creative process which is characterised by a researcher facilitating a process whereby the community analyses its own situation and uses that information to improve local conditions.

"serious limitations inherent in research exercises where the investigator fails to become part of the social environment that he examines". I became involved in the communities where I worked and carried out the research and through this process I became aware of my relationship to the communities.

> *"Involvement in the community we study may be the precondition for a critical understanding of the structures and processes we try to elucidate through our research".*(Hyden 1980:6)

The first phase of PRA began with a concentration on the agriculture and forestry system which serve as an introduction to the local production system and provided the base information for project implementation and the future research. The second PRA was on an aspect of the biomass production and management system; that of the use of trees and shrubs for traditional medicine. At the start of the second year the first set of formal questionnaires, on the history of the development of the village directed at Nuni village elders were completed. The second set of questionnaires were more in-depth, and were directed at individual households of the three different ethnic groups. The final part of the research was a socio-cultural PRA that provided the final points to the research. Running concurrently at times with the research were the project activities for which I was responsible. Carrying out training sessions, community workshops, demonstrations and village meetings. The details can be seen in table 3.1. In the research that was carried out, there was a mixture between participatory research techniques and conventional research methods. Schreckenberg, (1995:74), shows, in table 3.2, the differences between the two approaches, which in this case, were not conflicting but complementary.

Table 3.1 Research timetable, 1993 - 1995

	1993				1994				1995
	1	2	3	4	1	2	3	4	1
Observation and acquaintance	------								
PRA on agriculture and forestry		------	------						
PRA on traditional herbal medicine (see appendix 5)				------					
Installation, demonstration and facilitation (project)				------			------		
1st questionnaires on village history					------				
Realisation and management (project)						------			------
2nd questionnaires on households							------	------	
PRA on socio-cultural relations									------

Table 3.2 PRA methods versus conventional methods: some differentiating factors

Some Differentiating Factors	PRA Methods (maps, transects, walks, matrices, calendars, meetings)	Conventional Methods (transects, observations, yield measurements, market surveys, questionnaires)
Carried out by whom?	Research team	Lone researcher
Is experience of methods required?	Preferably	Not necessarily (often fairly standardised)
Is experience of area necessary?	Definitely	Very little
Whose time is taken up?	Local people's	Researcher's
Are expectations raised? Are underlying conflicts exposed?	Yes	Not to same extent

Source: Schreckenberg, 1995.

3.5 The PRA toolbox

3.5.1 Introduction

Central to the approach of PRA is the wide variety of techniques that are available. This is known as the PRA 'toolbox' which conjures up images of the mechanic who, although he rarely uses all the tools, has one that is appropriate for every situation. The PRA 'tools' are characterised by a strong emphasis on diagramming and visualisation techniques, such as maps, matrices and

calendars (see Pretty *et al*, 1995). The main PRA techniques that were used during the fieldwork were village mapping, transects, semi-structured interviews and community discussions and finally questionnaires (not traditionally a PRA technique).

3.5.2 Village mapping

The village map is a visual, participative tool, used in the initial planning stages of research and development. It is commonly applied to the management of communal natural resources. The map is a schematic representation that permits both researcher and farmer to visualise the village territory, its characteristics, its use and occupation, as perceived by the villagers. It is designed, with the help of the researcher, by the different social actors, men and women, that are involved with the management of the village's natural resources (Diarra *et al*, 1995). The map permits, in relation to the visualisation of the village's territory, the facilitator and the villagers,

- to understand the situation, extent and the division of different units of land, territory, vegetation and habitation in the village space;
- to appreciate the criteria for the distinction between units;
- to separate and recognise the use, the potentials and the constraints of the different units;
- to understand the modes of management.

These maps were central to the programming of project activities and provided an effective point of reference and discussion whilst engaged in community meetings. The village groups experienced no problems in using the maps, as sketching in the soil is a familiar and frequent occurrence. Like any technique however, maps cannot be used in isolation and there should always be an aspect of triangulation. Triangulation was used in the form of transects, semi-structured interviews and community discussions. Most importantly, however, there were discussions every day whilst I was in the farms working with the local farmers.

3.5.3 Transects

The transect is another visualisation tool which provides a detailed cross section of land use, habitation and local vegetation patterns. The transect is most effectively drawn whilst in the

company of farmers or local villagers as they can tell you the history of areas or can point out things that you cannot see, such as the site of the old village in Boutiourou. The transects contained in the following chapters were carried out by my counterpart and I and, although we were not accompanied by a group of farmers, we spoke to the people we encountered along the route and asked them certain questions. The purpose of the transects is to illustrate the different characteristics of the catena and the local morphology and the different landuses therein.

3.5.4 Semi-structured interviews and community discussions

Semi-structured interviewing (SSI) lies at the heart of all good research and development and although it is the most essential skill for participatory methods, it is also the most difficult to learn and the most difficult to train others in (Pretty *et al*, 1995). SSI is essentially about good communication, about talking to others and being understood and *vice versa*. There was no set place for the SSIs that were conducted; they ranged from in the fields, in peoples' houses, while walking along a track, while broken down, outside of my house and in the bar. It was partly through this manner that I was able to learn about and appreciate individual's value judgements, hopes, fears and beliefs.

Community discussions with the village group (either men's, women's or youth) were more formal than the SSIs. These were usually carried out on a minimum of once a month in every village. The community discussions were arranged in advance between my counterpart and I and the village group, depending on when both parties were free. They were conducted either in the village meeting place (usually under a big shade tree, e.g. *Ficus platyphylla* or a mango tree) or in the fields. Benches or chairs were provided for my counterpart and I (if the meeting was held in the village) in addition to those provided for the elders, the rest of the group sitting on the floor or on makeshift stools. My counterpart translated throughout these discussions and I initiated most of the discussion. These discussions were egalitarian, in the sense that anyone wanting to speak was allowed to speak and the participation was good. Mostly these discussions surrounded the project work concerning the tree nurseries or agricultural work in the later stages when a working relationship had developed. In the preparatory stages community discussion focused on every aspect of the production system and group consensus and group ideas were identified. It is also in these circumstances that the village maps were drawn.

3.5.5 Questionnaires

Although questionnaires are traditionally associated with the positivist research tradition (and their correspondingly poor reputation in social research arenas), it is possible that they can be used in a complementary fashion to other techniques. There were two questionnaires used in the research. Firstly, a questionnaire investigating the village history and addressed questions such as the evolution of land use, immigration and the spread of Islam in the villages. This questionnaire was addressed to the Nuni elders because they have been in the villages the longest and know the villages' history. Five of these questionnaires, that were written in French, were completed in each village, allowing sufficient cross referencing of the oral histories in each village. The second questionnaire was longer and was addressed to the individual households. If the objective of the community discussions was to gain insight into the overall production pattern and to some extent the co-operative and group nature of the local community, then the objective of the second questionnaire was to investigate the household production and consumption system. A total of 135 household questionnaires were completed in the three villages; 15 per ethnic group. The questionnaires were addressed to both the men and the women in equal shares.

A very important point to the use of the questionnaires is the timing of when they were carried out. The first questionnaire was completed after 12 months and the second questionnaire was carried out after 18 months. This has two benefits: firstly, the researcher has determined precisely the questions that they would like answering and most of the uncertainty of hypothesising has at this point been overcome; secondly, the respondents were already familiar with my presence and a level of trust has developed which allowed a freedom of expression on both parts.

3.6 Farming Systems Research (FSR)

FSR is a necessary research technique if the objective is to understand the farming system, how it has changed and how it is developing. As this is central to an understanding of the overall system (which includes the overall environmental capital in a village territory, the household production and consumption patterns and off-farm income) it was necessary to look at the three distinct

farming systems and how they are changing. The definition of a Farming System and FSR/E are provided in table 3.3.

Table 3.3 Farming systems and farming systems research (and extension)

Farming Systems	Farming Systems Research (and Extension)
A farming system is a unit consisting of a human group (usually a household) and the resources it manages in its environment, involving the direct production of plant and/or animal products. It is an ecosystem in which all of the components - land, operators, hired labour, crops and cropping systems, animals and machinery - are considered together to produce goods to meet the requirements of food, clothing and shelter; or, to exchange for goods to meet part or all of those needs. A farming system is always part of a larger social, political, economic and cultural environment, that impacts on everything happening within the farming system.	Farming Systems Research (FSR) is intended as a means to gather holistic, interdisciplinary data on how farmers use a variety of resources in agricultural production. Farming Systems Research and Extension (FSR/E) is a method for translating this data into research on improved methods and subsequent extension of these new farming systems approaches to farmers

Source: Left column, Beets, 1990. Right column, Christoplos, I, 1995.

The techniques of FSR are similar to the PRA techniques already mentioned, the difference being that it is the farming system that is examined in relation to the other factors of the production system. Hyden (1986:30) says this about FSR:

> *"Farming Systems Research and intra-household analysis may, at first glance, appear to be a tiny peephole but they are like a microscope: through this instrument we can perceive social phenomenon that have so far been largely unrecognised by observers of the African scene. By looking through the microscope, we can gain a better understanding of Africa's complex social processes and economic transactions".*

Carrying around the idea of a perfect 'farming system' is unhelpful to the African farmer. Christoplos (1995:14) quoting Mintzberg (1994) highlights the dangers of such responses that stem from western linear thought process: "FSR methods were originally based in traditional research and planning approaches wherein research and praxis or more broadly, thinking and acting (Mintzberg, 1994) are seen as separate stages in a temporally linear process". The distinction of thinking, and then action, is not always possible in a Sahelian African farming system; subsistence is the driving force. Farming systems thus develop sometimes spontaneously, sometimes seemingly chaotically but they are, more often than not, constantly changing. The introduction of PRA has helped the researcher understand this non-linear process.

3.7 The dangers of PRA

The development of PRA as a methodology has arisen because there has been a partial paradigm shift in development thinking. This is best typified by the adage, 'people are the solution and not the problem'. PRA in its early stages represented a radical shift partly because it developed from the South, mainly from Africa and parts of south east Asia which made it entirely different from positivist research methodologies that were firmly rooted in a western tradition. With the realisation that PRA was achieving some worthy results with rural communities, more and more development organisations started to place PRA in their approaches. It also became a very fashionable tool.

Today there is a rapid uptake of PRA approaches and their widespread use in the field of rural development. However, the central danger lies in the fact that organisations are simply using the name and techniques of PRA without any thought or uptake of the philosophy of PRA. For example, the words "use your own best judgement at all times" are rarely trusted in PRA activities and this is witnessed by the volume of lists, checklists and dos and don'ts that PRA manuals offer. These checklists offer a positivist screen to hide behind in what is ultimately a quasi ethnographic research approach which ultimately improves understanding through a prolonged period of contact with the researched group.

PRA is also about empowerment, introducing an analytical approach which is used by local communities to introduce and implement their own development activities. It is not simply a research technique, it is a tool for development. Schrekenberg (1996) should be praised when she says that RRA was used because she was not in a position to help implement development activities with her study group; she was engaged in *research*. Unfortunately, not all organisations have her integrity and frequently PRA is used for research by research organisations which raise the hopes and expectations of local communities which they are in no position to fulfil. One can imagine an African landscape inhabited by many depressed Africans whose sole purpose is again to fulfil northern research agendas. If research is the desired end product then RRA should be the tool.

In addition to this, it is a common misconception that PRA can be carried out in a similar time period as RRA. This is possible because it incorporates elements that overcome the superficiality of RRA. Yet PRA used in a rapid manner remains an extractive process, the difference here being that feelings are being extracted in addition to physical attributes. PRA is not rapid, it is a slow and time consuming exercise. The importance of time is highlighted by Roche (1994:165), who says "Being there and remaining there, even if no 'activities' are possible is important, for reasons which include moral support, playing a witness role, providing a symbolic presence, and enabling programme staff to reassess what role they can play and what new opportunities they might take". Rapid PRA is more of a danger to development work than RRA, at least RRA admitted its faults.

There is also the risk that the PRA methodology is seen as providing a rational, systematic and coherent framework from which to work from. However, this rationalist approach will effectively destroy PRA's ability to understand and work with messy, complex, unpredictable and chaotic production systems and rural realities.

A final aspect to the dangers of PRA which does nothing to improve the image of the African farmer lies in the centrality of visual aids for research. It was initially thought that because of the high levels of illiteracy and low numeracy levels, visual aids were an effective way to stimulate discussion and analysis. These visual tools were made with local materials, sticks, stones, leaves, etc, and diagrams were designed in the soil. However, with the advent of PRA uptake by organisations such as the World Bank, there have been glossy and sanitised reconstructions of the PRA toolbox which can be, literally, carried around in a briefcase and spread on any available surface. The recent World Bank Participatory Development Toolkit (World Bank, 1994) presents a stage in an aspect of PRA which should be worrying to all involved in development. It consists of very basic, roughly drawn diagrams in bright primary colours which include a diagram of a dirty and insanitary village made up of rundown shacks next to another diagram of a clean village with clean streets and toilets and modern buildings. The kit also contains games of snakes and ladders which would appeal to any child up to the age of ten. This kit implicitly says that if Africans could not understand the development objectives of the 1980s then they will have to be put across in a more basic manner. Not only are products like this an insult to the intelligence of

farmers, they also reinforce stereotypes and racist attitudes of the relationship between a trustee (the north) and a minor (the south) (Gardener and Lewis, 1996).

3.8 Problems experienced in the research

There were certain problems that were experienced in the research which essentially consisted of weaknesses on my part. Firstly was the problem of language. Throughout the research I was communicating in French to my counterpart who was then translating this to the local communities in one of the three languages in the Province. This was then transferred back through translation to myself. My contact with the villagers was two languages removed and it is inevitable that some nuances of communication were lost. Secondly, there was the problem that I was coming from a First World economy and background into a Third World subsistence economy. This means that there was much that was above and beyond my cultural comprehension and, to a certain extent, 'I had to unlearn that which I had learnt'. There was always the unconscious (but sometimes conscious) barrier that I was a 'wealthy white' and they were the 'poor African' and I had 'come to help'. However, while saying this, my involvement in the local communities was intimate, friendly and open and there were conscious actions by myself that attempted to break down these barriers (sleeping in the villages, eating with local families, etc.). Finally, there was some rivalry (again mostly hidden or unconscious) between certain groups seeking me as a benefactor who had access to important resources.

Whilst being conscious of the limitations of this form of data collection, I am convinced that the core experience provides data of sufficient quality on which to base the research.

3.9 Results presented in the text

All the tables and figure in the main body of text, if marked with 'Author's fieldwork' indicate that the information for the respective tables and figures was collected in the period from January 1993 to April 1995. Depending on the timing of the information, dates may be more specific, e.g. 'Author's fieldwork, 1994-1995'. In both cases the information was got from discussions with individual farmers, farmer's groups (men's, women's or youths) over the period mentioned. Tables or figures sourced 'Howorth, 1997' indicate that the information came from myself whilst

working on this study. French words in the text are presented in italics and local Nuni, Mooré or Fulfulbé words are presented in bold. All scientific names for plants and animals are also presented in italics.

The maps of the evolution of the landscape (figures 5.2, 6.2 and 7.2) were created from the visual interpretation of two sets of aerial photographs; one set taken in 1955 by the French *Institut Géographique National* and the other taken in 1983 by the *Institut Géographique du Burkina Faso*. The final 1993 map in the series of figures for each village was created from the IBS *Carte d'évolution des défrichements* 1988-1993 which was based on SPOT and Landsat TM satellite imagery with pixel sizes of 20 and 30 metres respectively. Although some of the accuracy will be lost using the latter source, it is of sufficient detail to provide comparative estimations in the growth or reduction in area of forest, fields and fallows.

3.10 Summary

The conclusions to this section are, that to use PRA and its associated techniques effectively there needs to be lengthy periods where the researcher is close to the communities he or she is working with: "successful use of [PRA] methods depend on the facilitator having a good understanding of the study environment" (Schrekenberg, 1996:119). Secondly, PRA is a not simply a research tool but a research and development tool and if used solely for research it can damage the communities it hopes to understand. Thirdly, the strength of the methods used for this study comes from the multiplicity of techniques used, including ethnographic, PRA, questionnaires and FSR/E, which allowed sufficient triangulation, whilst contributing to the development of local communities and their land use practices. It was through this working relationship that sufficient trust and understanding was built up on both sides allowing a good and constructive communication process. Dialogue was developed through time and contact.

4. CULTURALLY LOCATING PRODUCTION PATTERNS

Chapter overview

This chapter examines the three ethnic groups that form the focus of the study and looks at their major characteristics. As each group has a different history, different characteristics and motivations, it is necessary to examine each in turn. The purpose of this exercise is to understand, as far as possible, the rationale of the different ethnic groups and how this relates to their different management strategies. As the study is not purely anthropological it was decided to draw out and examine the major characteristics of the groups which relate to land management and survival strategies. The Nuni (4.1), Mossi (4.2) and Fulani (4.3) are examined in turn and the chapter is concluded in section 4.4.

4.1 The Nuni

4.1.1 Background

The Nuni (also known as Nuna or Nouna) ethnic group belongs to the larger Gourounsi (also spelt Gurunsi or Grunsi) ethnic group which totals about 230,000 people nation-wide. Duval (1985) estimated the Nuni population to be between 45,000 and 50,000 people in Sissili. The term "Gourounsi" is used by the neighbouring non-Gourounsi tribes and originally was a term of abuse meaning 'savage' or 'barbarian'. The land of the Gourounsi covers approximately 11,125 square kilometres, stretching 200km north to south and 260km east to west and its people represent 5.3 percent of the national population (Atlas du Burkina Faso, 1993:33). The Gourounsi ethnic group is made up of a number of different groups that speak the same Gourounsi language (coming from the Gour family of Sahelian

languages). Even though there are dialectic variations, comprehension between different groups is generally possible. The language of the Nuni is known simply as Nuni.

The Gourounsi (and Nuni) and their territory have been the focus of invasion and attack for many hundreds of years. Invasions, to capture and take back slaves, by the neighbouring Mossi tribes, specifically the Nakomsé (the Mossi nobles), stretch far back into history. In 1740 the Nakomsé invaded and conquered the land of the Nuni. Some of the invading Nakomsé settled, took Nuni wives and also the Nuni language. Some village names in Nuni territory have their roots in Mooré. Duval (1985) points out in his book "*Un Totalitarisme Sans Etat*" that the name of the Nuni village 'Bouyounou' is likely to have come from the Mooré word '**fuyunugu**' meaning a beautiful robe that transfers its magic to whoever wears it. Many Nuni today will not admit this history out of the shame of the memory of being conquered.

Besides the regular attacks from the neighbouring Mossi, there are two other major invasions in the history of the Nuni; the Djerma invasion and French colonial conquest.

The Djerma, an ethnic group from Niger, south-east of Niamey, came in 1880 to Dagomba, now in Ghana, with their spiritual leader Alfa Hano (Duval, 1985). The Dagomba kingdom used the Djerma, who were excellent horsemen, as mercenaries to capture slaves for trade with the Ashanti kingdom further south. When Alfa Hano died around 1870, the Dagomba king wanted to sever all links with the Djerma mercenaries. Consequently, the Djerma, numbering some 5,000 people (including 1000 horsemen), moved north through the Gourounsi region, pillaging as they went (Dupperay, 1984). They eventually settled around the villages of Léo and Sati in Sissili. The villages that remained free of Djerma oppression were those that agreed to pay heavy taxes of cowrie shells (currency at that time), cows, horses and slaves. After 1890, certain villages paid a million cowries, more that 100 slaves, young men and girls "or their value" (Duval, 1985:19).

In 1882 the Djerma attacked Sapouy, in the north-east of the province, with a force of 3000 horsemen, aided by the Nuni of Cassou. Here they settled for two years, trading slaves as far as the Togo coast. During the invasion certain villages were abandoned and the farmed area

considerably diminished. Besides for commercial purposes the Djerma had their own needs for horses, arms, grain and meat. Slaves were the currency for the acquisition of these goods and were necessary to maintain their status quo and for their own progression (Savonnet, 1970).

The Gourounsi (because there were numerous sub-tribes conquered) were partly responsible for their own dominion. They did not unite and it is said that they even sold some of their parents and wives for food (Dahourou, pers.comm, 1994). Certain villages collaborated, like Dalo (historically linked to Cassou) and supplied slaves, millet and maize taken from Bouyounou (Duval, 1985:19). The Djerma invasion was ended by the invasion of the French in 1896. This period was an important time in Gourounsi politics and represented a centralisation of power. In contrast to the Djerma invasions some of the villages regrouped to resist the French under one leader, the main centres of resistance being Sapouy, Cassou, Silly and Bouyounou which formed an alliance (Duval, 1985:20). Some other villages remained autonomous. Initially however, the Gourounsi welcomed the French as their liberators from the Djerma. Later the Gourounsi were to experience forced labour, with burning, decapitation, forced farming and public hangings. The tyrannies of the French epoch are still fresh in many of the elders' minds.

The most contemporary invasion to affect the Gourounsi has again been by the Mossi but this time accompanied by a nomadic group, the Fulani. But this time there has been no pillaging or slave trading, it has been an invasion in search of agricultural land. This new invasion, that began in the 1970s is the subject of the research.

4.1.2 Power and governance in Nuni communities

There are two important positions in Nuni communities, one that governs the land and one that governs village politics. The former is the *Chef de Terre* or Land Chief (**Tiatiu** in Nuni) and the latter is the *Chef de Village* or the Village Chief (**Pio**).

The Land Chief is the descendant of the first family to arrive in the village. It was he that first cleared some land to farm under the benevolence of the local divinities (of the land, the

bush, stream, rocks or cliffs, etc. (Savonnet, 1970)). Once he has been placed under their divine protection he becomes a master of that land and it is to him that new arrivals must come before touching the land. In some villages the elders believe that the original Land Chief of the village was present at the moment of creation, when God separated the land from the sky. Thus it is implied that God Himself has assured the validity of the Land Chief's lineage. The Land Chief always comes from the same family, if he dies then it is his oldest brother takes charge. If he has no brother his eldest son will inherit the responsibility.

The principal role of the Land Chief is to oversee and supervise everything that has to do with the land, including the bush, the farms and the wildlife. He is seen as the mediator between the human world and the divine world of the ancestors and spirits[1]. He has numerous responsibilities.

If a person would like new land to farm then the Land Chief must be consulted first. He will indicate which piece of land the person can cultivate, what he must do first, i.e. the sacrifices he must carry out. If the harvest is a good one then the new farmer must give presents of thanks to the Land Chief, usually, a chicken, a sheep and a pot of millet, (De Bolster, 1992). He must also make a sacrifice to the divinities.

If a person requires a piece of land to build a house upon again it is the land chief who will choose the site and then ask the land spirit (**Tia** in Nuni) to bless the new construction. He can also be a rain giver, providing offerings to the spirits to wet the land. He is said to control the fertility of the land and thus female fertility. He is also a war spirit, a priest, a judge and a doctor, healing the land (Duval, 1985). In all cases it is necessary to thank the **Tia** through sacrifices and offerings.

Thus, the Land Chief has considerable power and responsibility in the life of the community. He is a religious chief of the first order but he is more than that, he watches over the serenity and harmony between the secular world and the supernatural world (Dupperay, 1984).

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[1] Religion and spirituality play a crucial part in peasant societies. For example, Dobrowolski in 1958 (pg 289-290) talks about the Polish peasantry, "...they [the holy men] often acted as intermediaries between the world of the super-natural and peasant rank and file, who, feeling helpless, looked for support to these highly influential people".

Although he is probably the most important person in the village he has no power outside his area of influence; his territory. He rarely speaks alone, he has his counsel of village elders of the important lineages who help him decide and govern.

The Village Chief (**Pio**) governs everything human. He orders social affairs and has command over all the lineages of the village. The Village Chief is also the descendent of the first or second family to settle in the village and he inherits the title in the same way as the Land Chief does. The Village Chief has the power of decision in the village and he is charged with maintaining order. To reach his decisions he will almost always invite the Land Chief and other elders of important lineages for debate to orient life in the village.

Other positions of power in a Nuni community are chief of the canton and the head of the household, *Chef de Famille*. The canton chief will often be the first member of a new family to settle in the village and set up a new neighbourhood. He will be under total control of the Land and Village Chiefs but will be expected to regulate the minor affairs of his own quarter, with some control over how the land of his canton is distributed, including the village fields, to the members of his canton. The head of the household will control all the family affairs and have ultimate say in all family decisions. The head of the household can distribute his land amongst his family members; this also includes land around the compound.

4.1.3 The Nuni farming system

In Nuni villages, the compounds are surrounded by household fields or **guédwi**. Varying in distances of between 2 to 7 km away from the households are the bush fields or **karé**. The household fields operate in much the same way as the first ring in the Mossi ring management system (see section 4.2.1). Household field sizes are usually less than half a hectare and are used to grow high value crops, dominated by maize, but also including red sorghum, tobacco, cowpeas, okra, sweet potato, cassava and some vegetables. These are under permanent cultivation, having no fallow period but receiving inputs in the form of organic household rubbish and animal manure from cows, goats, sheep or chickens. Village fields or personal fields (**guedwa**) are found between households in the central area of the

village and are mainly used for maize production and serve the purpose of ensuring grain for the hungry period (i.e. they are the first crops to be harvested and fill dietary requirements before the main harvest). Only an elder in a family line can 'own' a **guedwa**. However, the 'owners' of the field are often not those that cultivate the land, it is the youth and the land is often seeded by children of 5 to 6 years. Even though the harvest of this field is for the whole family, it is still 'owned' by the particular elder. This serves to keep the hierarchy of governance in place. Women often have personal fields and in these cases all the work is carried out by the women. Women's personal fields are usually given over to groundnuts which are sold to provide cash (Agrotechnik, 1991). Village fields tend to be from half to one hectare. The bush fields are much larger, from 2 to 8 hectares, and are farmed from between 4 to 15 years after which they are left fallow for 10 to 30 years.

The bush fields are a collective possession of the residential household (i.e. the ensemble of relations in one residence: an elder brother, his younger brother, their wives and children, the unmarried girls and the sons' offspring (Dupperay, 1984)). The oldest of the men in the unit does not participate in agricultural work although he may supervise. All farming work is done by men, under the direction of the elders, with the exception of seeding which is done by (fertile) young women (a traditional symbolic fertility rite) and also the transport of the harvest. The latter is carried out by all of the women in the household in the form of headloads[2], or if available a donkey and cart.

Traditionally women are not meant to farm, except for their field of groundnuts and helping with seeding and harvesting. Presently, however, the socio-economic trends (increase of the need for bought goods, exodus of young men to find paid work, etc.) are forcing women to become involved with more and more agricultural activities and are changing the traditional social norms.

[2] The headloads are carried in head panniers which are symbolically the most important item of a woman's equipment. It contains the food necessary for physical reproduction; it symbolises the fertility that feeds the family. This symbolism is manifested in funerals, where if a woman dies away from her village her pannier will be sent back with the ritual phrase "*nous voulons lui redonner son panier*" [we wanted to return her panier] the panier symbolises the wife (Duval 1985:107). This panier can then be buried in place of the body if the latter is irretrievable.

The harvests are then winnowed (removed from the grain stalks and heads) and then put in the granaries. Once in the granary the harvest is only accessible to the women with the permission of the head of the family. It is the family head that distributes the grain every three days which the women ration and cook (Duval, 1985).

In certain fields, because of their bigger size, the farmer needs help to weed, clear or harvest, in which case he can call the group or **kampéné**[3] (a word which has its roots in the English 'company' which is thought to have been introduced by Nuni immigrants that went to work in Ghana) to work in which case the farmer will pay the group in cash or kind. The 'employer' will provide the **kampéné** with food and drink for the work period. The money he pays will go into a central '*caisse*' or kitty and will be used by the group at festivals or for group investment. The **kampéné** is controlled by a president, vice presidents and two 'commanders' who oversee activities but do not participate in the work (Duval, 1985). They regulate the members, fining those who do not turn up for work.

This form of agricultural organisation still exists alongside of the more modern form of agricultural organisation; *le groupement villageois* or village group which have been primarily formed as a prerequisite for investment by NGOs and government services in the village.

The collective field (*champ école* or *champ de groupement*), is a field that 'belongs' to the group, the men's group, women's group or youth group. It is worked collectively, normally one day per week in the farming season, and its purpose is to increase the revenue of the group's *caisse* or kitty. The better organised groups use the harvest from the field to create a small cereal bank which serves a commercial or social function depending on the year (i.e. in a good year the extra harvest is sold off, in a bad year, the grain is stored in case of need). Otherwise, as is frequently the case, the proceeds of the harvest are spent on celebrations at the end of the agricultural season. They can also be used for loans, with or without interest.

[3] The **kampéné** is a work group. It is made up of all the able bodied men in the village. It is called together when there needs to be a large task undertaken that benefits the whole community, e.g. the construction of a well, repairing a road etc. (Dupperay, 1984)).

The Nuni production system reveals a secular *savoir-faire* in relation to soil and water conservation, not only by leaving a significant amount of trees in their fields, but also by their practice of *buttage* (mound making around individual plants) and *billonage* (roughening up the soil around the plants to reduce run-off and increase infiltration) and also, through a recognition of the important fallow species (see below). Earth bunds are also built to protect fields against flooding.

The recent appearance (in the late 1980s) of ploughed farming (mono or dual ox-ploughs are often preferred over donkey ploughs by the Nuni because they tend to cultivate heavy soils, this is reversed for the Mossi) does not seem to have posed too many ecological problems. In spite of this, the Nuni never practice total tree clearance of their fields, even when re-cultivating old fallows that were farmed with a **daba**.

Figure 4.1 shows the Nuni agricultural calendar[4]. It provides information on a range of variables and activities in the Nuni year, including staple foods, times of harvest, seeding, farming activities, labour allocation and rainfall. The preferred food staple is millet which is purchased from the market when harvest supplies dwindle. The most critical time for household food security is between May and June, called the *temps de soudure* or the hungry period. It is at this time when gathered forest fruits and wild foods (see figure 4.2) are critical for sustaining household food security. Labour requirements are highest in the month of March which coincides with field preparation and seeding times and at harvest time. Labour demand remains high throughout the rainy season.

[4] The information for this diagram was collected from farmers through discussion and direct questioning over the two year fieldwork period.

Figure 4.1 The Nuni agricultural calendar

| | | |

Key for farm harvest

A	Aubergine
B	Beans
C	Cassava
Cb	Cabbage
G	Groundnut
M	Maize
Ml	Millet
O	Okra
On	Onion
P	*Petits poids*
S	Sorghum
Sp	Sweet potato
T	Tobacco
Tm	Tomato
Y	Yam

Farming activities

Cc	Crop care (weeding, thinning, replanting, etc)
Ef	Early fires
F	Fertilizing
Fb	Field burning
Fc	Field clearing
G	Gardening
H	Harvest
M	Mound making (around the individual plants)
Pr	Preparation of next years fields
S	Seeding

4.1. Hunting and gathering

Wild fruit trees found on village territory belong to everyone and everyone has a right to their products - they are collective property. Trees in fields, however, belong to the elder who has usufruct rights, even if the field is fallow. Even though children may gather fruits as they will, in play or whilst at work, their gathering activities are informal. It is forbidden to harvest all the fruits for personal use at the expense of others' rights to harvest[5]. Gathering, as an activity, is firmly rooted in the domain of women (and is discussed in the case studies). It is rarely an individual activity and is usually done in groups; women from one compound or family unit group together for forays into the bush to collect plants or fruits for their needs. Gathering, again, sees the operation of a hierarchy with the eldest woman supervising the work, and she eventually may appropriate most of what has been gathered for her own uses and purposes (Duval, 1985). In general, unless some of the gathered product is consumed (or part consumed) in the bush or fields, the gathered product is used for the common good of the residential unit. Figure 4.2 shows the gathering yearly calendar which demonstrates the range, variety and seasonal distribution of gathered tree products (which includes domestic species like grafted mango). The Nuni rely significantly on tree products for household food security throughout the year. Collected tree products include roots, leaves, flowers and fruits and are often highly nutritious. They are mostly used as sauce

[5] The Nuni have a similar traditional law where a traveller, whilst taking rest, may help himself to a crop (such as yams or sweet potatoes) to feed himself. However it is again 'illegal' to take too much, which would be classed as theft.

ingredients that complement the To. Some tree products are also traded, like the *karité*, *néré* and *kapokiér*, and sold to provide an important source of money, especially for women.

Figure 4.2 The forest food gathering calendar[6]

Tree product	Am, Af, Bc, Dm,	Af, Dm, D,	D,	Aa, Ba, Lp, Tl, Vl, M,	Al, Aa, Ba, Lp, Pb, Tl, Vl, M, X,	Al, Bs, Bp, Lm, Pb, Pr, Sb, Tl, C, X, Bf,	Al, As, Bs, Lm, Pr, Sb, Tl, C, Mg, Bf,	As, Bp, Sb, C, Mg,			Tf, Vf, Ms, P,	Am, Bc, Dm, Tf, Vf, P,
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

Source: Author's fieldwork, 1993-1995.

Key

Am	*Acacia macrostachya* (seeds)	Dm	*Diospyros mespiliformis* (fruits)
Af	*Adansonia digitata* (fruits)	Lm	*Lannea microcarpa* (fruits)
Al	*Adansonia digitata* (leaves)	Lp	*Leptadenia pyrotechnica* (fruits)
Aa	*Afzelia africana* (leaves)	M	*Mangifera indica* (fruits - non-grafted)
As	*Annona senegalensis* (fruits, flowers)	Mg	*Mangifera indica* (fruits - grafted)
Ba	*Balanites aegyptica* (leaves, flowers)	B	*Musa spp.* (banana)
Bf	*Balanites aegyptica* (fruits)	Pb	*Parkia biglobosa* (fruits, seeds)
Bc	*Bombax costatum* (calyx, flowers)	Pr	*Piliostigma reticulatum* (leaves)
Bs	*Boscia senegalensis* (leaves, fruits)	Sb	*Sclerocarya birrea* (fruits)
Bp	*Butyrospernum parkii* (fruits, seeds)	Tl	*Tamarindus indica* (leaves)
P	*Caricum papaye* (fruits)	Tf	*Tamarindus indica* (fruits)
C	*Citrus spp.* (fruits	Vl	*Vitex doniana* (leaves)
D	*Detarium microcarpa*	Vf	*Vitex doniana* (fruits)
		X	*Ximenia americana*

In the Sahelian, Sahel-Sudanian and Sudanian (Millington et al, 1994:55-57) eco-zones, where limited and variable rainfall makes harvests irregular and uncertain, the products of local woody plants are of primary social and economic importance for rural populations (Guinko and Pasgo, 1992:16). Guinko and Pasgo, who carried out research in the province of Zitenga, noted that tree products, such as leaves, flowers, fruits, seeds or tubers, are sometimes eaten on the spot (fruits), after cooking (flowers) or after considerable processing

[6] The information for this diagram was collected from women and men through discussion and direct questioning over the two year fieldwork period.

and preservation (e.g. shea butter, **soumbala** (see glossary in appendix 1)). They also point out that many products are eaten raw or cooked 'in season'.

Hunting in Nuni society is exclusively a male activity; a woman cannot even touch or hold a bow and arrow. Hunting, however, in Sissili, is on the decline, because of the population increase and the introduction of the gun which allows a more effective killing capacity. There are (or were) two types of hunting activities; the collective hunt, thought to have disappeared in the region since 1950/55 and individual hunting. Individual hunting is occasional and is practised by almost every peasant, in his fields or in the bush, usually for monkeys, grasscutters (a herbivorous large rat), birds and occasionally bush pig. When a kill is made, it is for the eldest in the household, in the usual hierarchy (Duval, 1985).

The Nuni's land, both field and fallow, is characterised by the important presence of the néré tree (also called the African locust bean). Traditionally this tree is sown in farmers' fields and its use and exploitation is regulated by strict social laws. It is not unusual to count as many as 30 trees per hectare. The néré, a member of the Mimosaceae family, contributes to soil fertility by the constant, year round, shedding of its leaves. The farmers however, attribute a negative value to the tree in cereal fields, and often prune the tree crown to reduce crop shading. Maiga (1987) showed that néré can cause a drop of 32.3 percent of grain production in plants in close proximity to the tree.

Box 4.1 Néré or African locust bean - *Parkia biglobosa (jacq.) Benth*, Mimosaceae family

The néré is used for many things by Nuni and Mossi alike:

- It is an important food. The seeds are rich in fat and proteins. They are fermented to give a 'vegetable cheese' called **soumbala** which is used for food seasoning, very much like a stock cube, with a very distinctive taste. **Soumbala** is the object of local trade throughout Burkina Faso and Mali.
- The yellow 'pulp' which surrounds the seeds in their pods contains 60 percent sugar and is fermented to give a high energy drink, which is often drunk before going to the fields.
- The leaves, bark and roots are used as cures for a multitude of ailments including haemorrhoids, guinea worm and sterility.

Source: Author's fieldwork, 1993-1995.

The karité (*B.parkii* or *Vitellaria paradoxa*) is equally as important to the Nuni. Karité are usually found on ferruginous soils (**dio**) or vertisols (that have not as yet been exploited - the Nuni prefer to keep the néré in their farmed area because karité are extremely prolific in the bush). Karité are rarely planted by farmers and they predominantly rely on natural regeneration. Their presence in the already exploited bush represents a selective felling on the part of the Nuni rather than a plantation effort (De Bolster, 1992). Karité nuts occupy a very important place in the local women's economy (see box 4.2) as the preparation and trade of karité butter is solely a female activity. Again, in Maiga's (1987) research, he showed a drop in grain production of 30 percent in those cereal plants around the karité's crown.

Box 4.2 Karité or Shea nut - *Butyrospernum parkii (G.Don) Kotschy,* Sapotaceae family[7]

The karité's principal benefit is its butter which plays a crucial role in the local (and national) economy. To make the butter, the ripe fruits are collected in the rainy season. After eating the ripe pulp surrounding the 'nut' or by removing it through stockpiling them and letting the pulp ferment away, the nuts are cleaned and collected. The nuts are then boiled in water then dried, this process separates the inner seed from the hard seed coating. These are then pounded in a pestle and mortar to crack the outer seed coating. The mixture is then winnowed, in a strong wind, to separate the seed from their coatings. To stop the seeds germinating they are dried, leaving only about 10 percent water content so they can then be stored for long periods. To extract the butter the seeds are heated above an open fire until they begin to 'weep', i.e. exude oil. They are then placed in a mortar and are pounded by numerous women at the same time. A paste is then obtained. The temperature must be kept above 40 °C so that the oil remains liquid and can be poured out into an iron pot. After it cools down it solidifies and it is then ground between two stones. It is then placed in a container and boiling and cold water are alternately poured onto it. Little by little the butter loses its red colour and begins to whiten. It is shaped into balls, and heated again in an iron pot while keeping the balls constantly damp. A creamy layer then forms on the surface of the balls which is karité butter of the finest quality.

The poorer quality butter can be transformed into soap[8], candles, preservation grease, magarine or beauty products. It is used industrially for chocolate and lipstick production. Karité butter and its products are imported to Europe, America and Japan. Karités other uses include good quality charcoal wood (although because of its value as a fruit tree this is rarely done) and local medicine.

[7] This box draws on Von Maydell, 1992.

[8] The vegetable oil (karité butter) is saponified using potash (potassium hydroxide) derived from the ash of a number of tree species (particularly *P.thonningii*) or sorghum stalks (Schrekenberg, 1996).

The fallows are often covered by a bush called **tio** in Nuni (*D.cinerea*) from the Mimosaceae family, which is recognised as a plant which reconstitutes soil fertility (both locally and scientifically (see Von Maydell, 1992:229)). This species reproduces very easily by suckers but is not considered an invasive species as it can be cut back very easily. It is also valued for its forage (leaves, fruits and seeds) its wood and bark for rope, baskets and matting, and for local medicine.

4.2 The Mossi

The historical invasions by the Mossi apart[9], there have been two phases to the wave of migration that has taken place over the last 30 years. The first Mossi farmers arrived 30 years ago into an unknown landscape where many of the conditions were different to those in the north. They imported their farming techniques that were learnt from generations of farming in a dry, Sahelian environment. Their first stages of agriculture are almost complete tree and shrub clearance from the fields, removing the protective cover. These were the original Mossi that were given land by the Land Chief.

The Mossi are effectively confined to their own 'territories' within the Nuni village territory. The new Mossi settlement functions the way any 'new' traditional village would. The first family to arrive becomes the family of the chief. It is this family that regulates internal Mossi affairs and their farming activities. It is him that new immigrants must see first, if the Mossi chief accepts the new immigrant (usually kin to another member of the existing Mossi community), then he will send him to see the Nuni chief to seek his approval. Minor Mossi affairs are handled by the Mossi chief, grave misdemeanours or serious issues are dealt with by the Nuni chief who has the right to expel any member of his community, immigrant or not (though this rarely happens).

After the original Mossi immigrants, the next wave of immigrants regrouped around the Mossi that had already settled in villages in the province. Mathieu (1994) noted that the

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[9] Totté (1994) reports that the first major wave of immigration by Mossi farmers came between 1911 and 1947. This was thought to have started because of forced labour recruitment by the French colonialists, rising taxes in the north, droughts, forced cotton cultivation and, until 1946, forced labour for working the Niger Delta or plantations in Côte D'Ivoire.

Mossi consequently recreated the social and spatial structures that exist in their homelands, i.e. the hierarchical organisation of labour, governance and distribution of space (see later text). This can be seen in the case study villages where the original Mossi regulate the number of immigrants and their activities before sending the new arrivals to see the Nuni land chief. This is based on an understanding between the land chief and the Mossi leader or 'chief' that the Mossi will get no more land and therefore it is the Mossi chief's choice whether or not he allows new settlers to be accommodated on his new land.

The Mossi have a specific system when welcoming a new migrant into their territory that allows the newcomer to have a minimum production level in the first year. As already mentioned, the newcomer must pass by way of a Mossi who already lives in the area who is prepared to speak out on behalf of the new migrant. In exchange for this, the new migrant must provide a service to the original Mossi that usually includes days of work in the busiest times of the year, e.g. at weeding time. Added to this, the new migrant must clear his own new parcel of land. Because of the level of work required he is forced to call in external labour to help him if he wants to have an adequate harvest in the first year. In exchange for this 'favour', he must give his labour in exchange in the dry season, making houses and thatching. In this way, the Mossi are embedded in relationships of obligation and reciprocity which some may view as oppressive and others as being a successful part of their livelihood strategy.

The Mossi quarters are a reflection of Mossi settlement structure in their homelands in the north. One family is housed in a **zaka** (a compound). Each **zaka** is separated from its neighbours by an area of agricultural land. Different **zakse** (plural of **zaka**) are grouped together in loose agglomerations according to different cantons (**sakse** in Mooré). The organisation of the agricultural work is arranged in counsel with the whole neighbourhood.

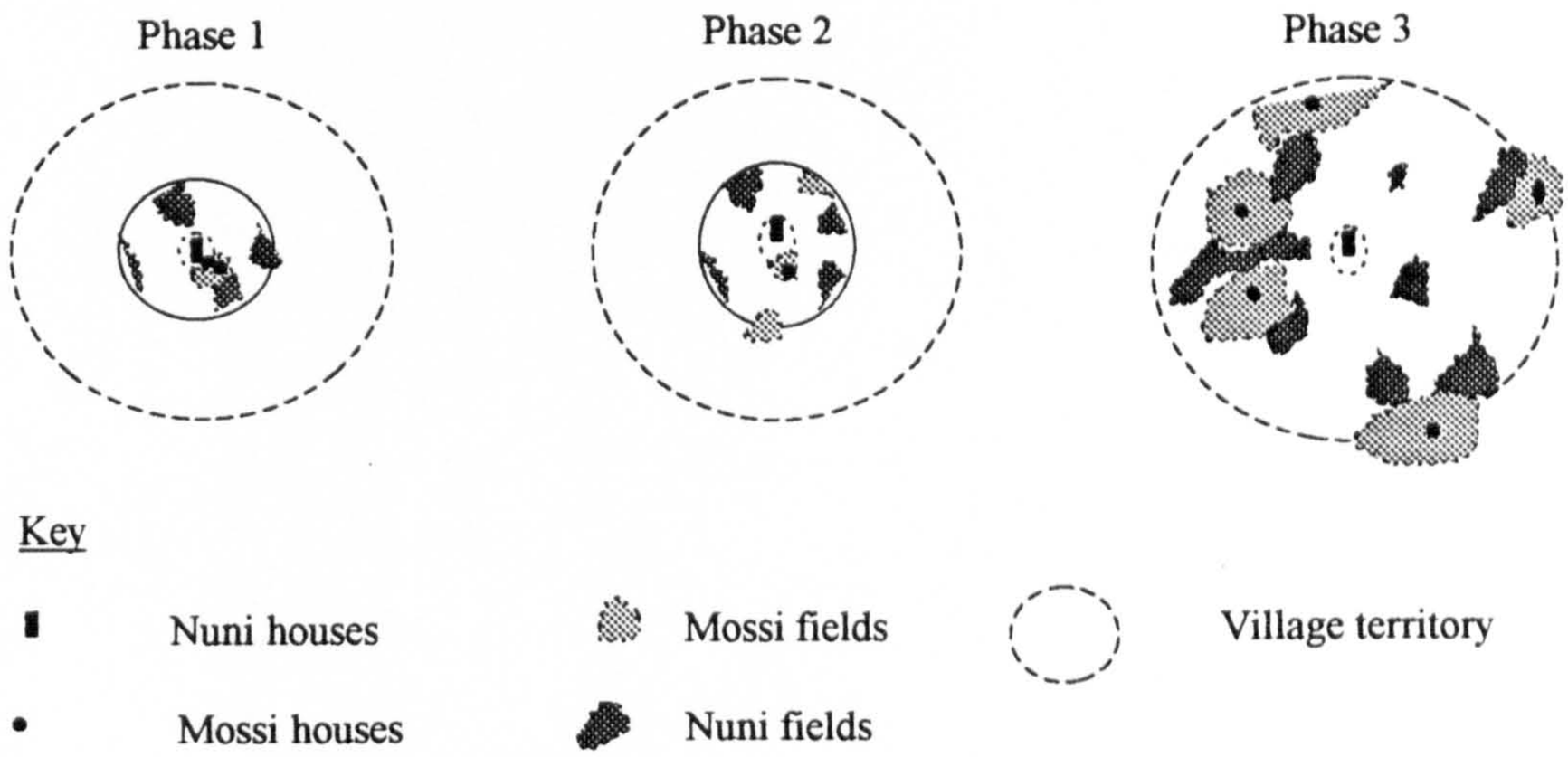
A remarkable difference between Mossi society in Sissili compared with that of their places of origin is, in Sissili, the entire Mossi family works on the farm. In the Mossi homelands, it is not unusual to find large Muslim families with many of their children attending Koranic school. These youth and children provide an important labour source and must cultivate the fields of the Koranic teachers, allowing the teachers and their wives a freedom from

agricultural work. Also, in the Mossi plateau, a Mossi farmer will seem less 'courageous' or inventive with his agricultural practices compared to his activities in Sissili. This is because, firstly, the Mossi farmer is free from control and the social constraints of the traditional Mossi society, that interferes with his own development, (e.g. jealousies, slander, sorcery, poisoning), and secondly he suffers an 'inverted' social pressure that pushes him to produce more so that he can to subsidise his larger family in his homeland (De Bolster, 1992).

The Mossi, in the first instance, will occupy fallows left by the Nuni that are in close proximity to the Nuni quarters. This arrangement serves two interests; firstly, the migrants need the use of the local infrastructures (wells, boreholes, markets, etc) and, secondly, the host community is able to survey the migrants, to control and monitor their movements (Totté, 1994). Progressively, after building up a network of relationships the Mossi will attempt securing better land further into the bush (figure 4.3 illustrates this process of sequence occupation). Mathieu (1994) suggests that the land given to the Mossi at this stage may be 'problematic land', areas where the land ownership is unclear, e.g. between boundaries of village territories, as in the cases of Lon and Boutiourou, or in zones that are traditionally used for grazing.

Totté (1994) carried out research in southwestern Burkina Faso in the *Hauts-Bassins*, an area of extensive cotton production. His study examined the impact of Mossi immigrants on the cotton dominated local production system. Although there are similarities between the *Hauts-Bassins* and Sissili, there are also some important differences to be noted. Firstly, the *Hauts-Bassins* experienced significant immigration long before Sissili; immigration on a large scale started in the early 1960s and was characterised by economic motives. This has implications for the early saturation of space. Secondly, the culture of cotton cultivation in favour of subsistence crops (in Sissili this situation is reversed) means that extensive land areas are needed and which leads to land shortage. Both these factors lead inevitably to out-migration (in Totté's analysis) of the original Mossi when population becomes too high and land too short.

Figure 4.3 The evolution of the occupation of space after the reception of Mossi immigrants

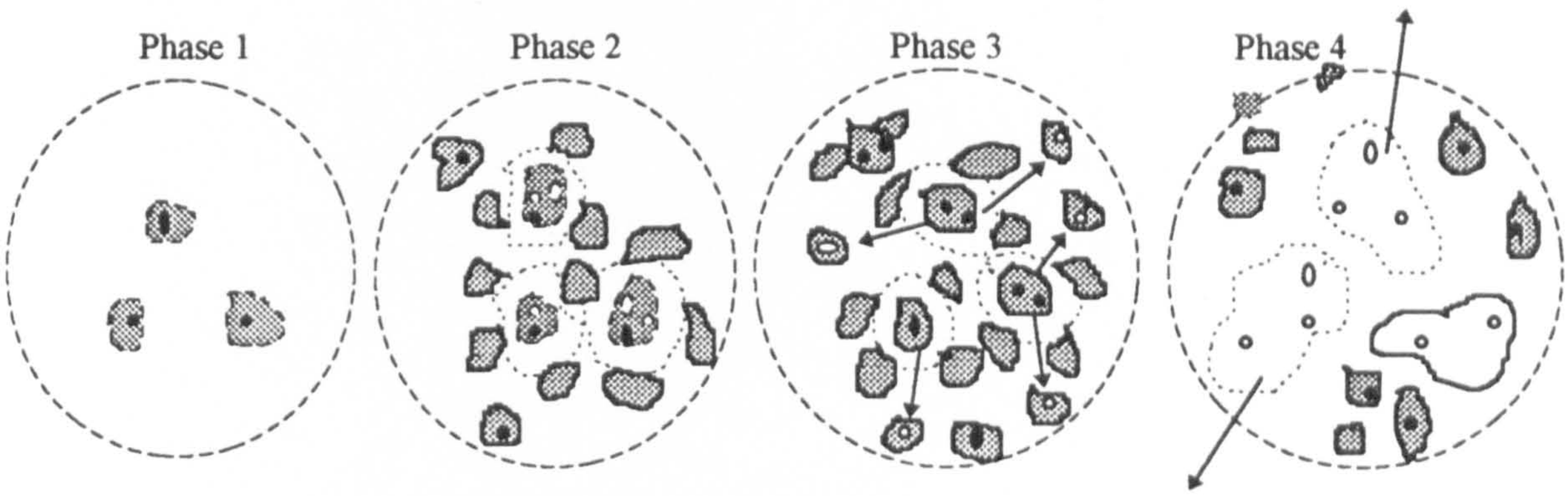


Phase 1: The settlement of the first immigrants very close to the Nuni settlement on the Nuni fallows
Phase 2: The migrants open new fields in the bush.
Phase 3: The migrants construct their houses in the bush; the Nuni attempt to surround the Mossi fields for surveillance..

Source: adapted from Totté, 1994:62.

Totté (1994) points out that once the migrants attained sufficient cultural autonomy (which is a result of the Mossi inhabiting land areas which are sufficiently isolated and have the ability to be easily expanded) there begins a process of autodevelopment with a strength of governance. With this semi-autonomy comes a call, from the original Mossi, of welcome to other northern Mossi, usually of the same lineage. It is for this reason that there are concentrated areas in Nuni territories of high Mossi populations, much higher than the indigenous populations. These have, according to Totté (1994) two main implications: firstly a reduction in the cultivated area and secondly a move for new fields, further and further away from their habitation zones. To try to remedy this situation the migrant will move and rebuild his house in his fields in the bush where he will try and create a new settlement. The new free fallows are then available for the new migrants.

Figure 4.4 The evolution of the agricultural organisation of the Mossi immigrants



Phase 1: Installation of founding Mossi
Phase 2: Enlargement of Mossi farmed areas and the arrival of new immigrants close to the original settlers.
Phase 3: The new immigrants achieve their own economic and spatial independence.
Phase 4: The departure of the old families and the arrival of new families which occupy the old fallows.
Source: adapted from Totté, 1994:62.

Totté (1994) notes that in the case of land shortage there is a higher mobility, i.e. the Mossi will move to other areas when farmland becomes scarce. The more recent immigrant will only find recent fallows to occupy. This land is their only option as all the other land has been used. After only a few seasons they will have to find new land to compensate for the poor soil fertility of the recent fallows. In the southwest of Burkina where immigration pressure is higher than Sissili, there is seen a four stage sequence (see figure 4.4). Firstly, is the settlement of the first Mossi immigrants who have ample land to farm. Secondly is the arrival of new migrants who build their homes close to the original Mossi, some Mossi go deeper into the bush and the first fallows are left. The third stage sees the newer immigrants acquiring their independence, both economically and spatially. The final stage is the departure of the original immigrants to new areas and the arrival of new migrants who occupy their old fallows.

There are similarities between Totté's analysis on the process of sequence occupation in the *Hauts Bassins* and in present day Sissili (and the case study villages). Figure 4.3, the

evolution of the occupation of space after the reception of the Mossi immigrants, echoes the development of the post immigrant landscape in Lon and Boutiourou (although not in Saboué where there is no evidence of surveillance). However, figure 4.4, the evolution of the agricultural organisation of the Mossi migrants, can only be related to Lon, which is in the cotton producing zone of Sissili. Lon has experienced the three phases seen in the diagram, with the progressive introduction of Mossi from various lineages from different areas and the consequent use, by the newer Mossi, of the fallows that belonged to the original Mossi. Phase four, as seen on the diagram, however has not been experienced and, in the author's opinion, is not likely to occur. This is due to two factors; firstly, immigration has stopped in the village (the Mossi chiefs in conjunction with the Nuni chiefs have decided that there is no more land available for new migrants) and secondly, there is a higher ratio of food crop production than cash crop production.

4.2.1 The farming system of the Mossi

The Mossi employ a ring management system[10] of crop and soil management which has been imported from their zones of origin into Sissili. In the Mossi ring management system, the fields are located in rings around the compound. It is still apparent that these rings correspond to the household, village and bush fields because of the type and nature of crops grown on them.

There is a distinction in both Nuni and Mossi production systems of household fields, village fields and bush fields. These terms refer to fields which are both spatially different and also fulfil different household needs that correspond to different crop types in the different fields. The household field is, as the name suggests, adjacent, or, in close proximity to the compound. Here high value crops are located which require relatively high inputs such as fertiliser, labour and sometimes water. The village field is located in the spaces between compounds in the village and are used for staple foods, which require larger surface areas. Again, investment in these fields is still relatively high. The bush fields can be as far as 6 km

[10] In this system, different crops and cropping patterns are observed in concentric rings around the village compound, with the frequency of cultivation or intensity of land use declining as one moves away from the compound in a similar manner to Von Thunen's location theory (Prudencio, 1993:237) although the determinant here is labour input not bid rent.

away form the compound, but are usually much nearer (normally from 1.5 to 4 km from the house). Here staple crops are cropped on large land parcels.

In the Mossi ring management system the first ring corresponds to the household field. These fields receive the highest inputs and, in a study by Prudencio[11] (1993:244), it was shown that nine tonnes of manure per hectare were added to these first fields.

Table 4.1 Crops and their roles in the first ring/household field

Crop	Role	Comments
Maize (*Zea mays*)	To improve food availability in the hungry season.	Maize is the first crop to be harvested and has the shortest rotation (60-90 days). The amount of manure available will determine the area planted.
Sauce plants: Niébé (*Hibiscus sabdariffa*), sweet potato leaves (*Ipomea patatas*)♠, cowpea leaves (*Vigna sinesis*), okra (*Hibiscus esculentus*), cassava leaves (*Manichot utilissima*)♠	Ingredients to complement To, provision of vitamins and minerals.	Sauce ingredients are vitally important in the daily diet as they flavour the meals (which are commonly 'meat-less') an absence of sauce would mean an incomplete diet. Grown sauce ingredients are complemented with wild sauce ingredients, e.g. baobab leaves.
Tobacco (*Nicotiana tabacum*)	For smoking and sale or trade.	Needs heavy manure application.

♠ These are principally grown for the sauce but the tubers provide an additional form of nutrients in the hungry period.

Source: based on Prudencio, 1993.

In the second ring, the village field, manure applications are also common (Prudencio (1993:244) noted an application of 1.3 tonnes of manure per hectare). Crops typically grown on the village field or second ring include red sorghum, cowpeas, (the major crops) and groundnuts, millet, white sorghum, tubers (used in rotation). In general, these fields make up about 30 percent of the total cultivated area but provide 40 to 50 percent or more of the total crop output value per year (Marchal, 1982).

[11] Prudencio (1993) carried out research into the Mossi ring management farming system in a Sudanian region of Burkina Faso.

Table 4.2 Crops and their roles in the second ring/village field

Crop	Role	Comments
Red sorghum (*Sorghum vulgare*)	Provision of staple crop (least preferred)	There are four reasons for red sorghum to be located here: it responds best to moderate manure application; it has a shorter rotation (90-120 days) than millet or white sorghum (120-180 days); it is the least palatable of the grains for To, so it is consumed less and so lasts longer (i.e. it is a risk minimiser); it is used to make dolo and so has a market value and can be sold in case of problems.
Millet (*Pennisetum typhoides*)	Provision of staple crop (most preferred)	Millet is grown to a lesser degree here because it can grow on poor soils often found in the bush fields.
Cowpeas (*Vigna sinensis*)	Provision of protein crop	Cowpeas form a very important protein source for the household. These are intercropped with sorghum or millet.
Sweet potato (*Ipomea patatas*), bambara nuts (*Voandeia subterranea*)	Cash crop and/or food crop supplement	Sweet potatoes and bambara nuts are grown in rotation with sorghum and millet. Bambara nuts are boiled and used as snacks or can be sold as hot snacks.
Groundnuts (*Arachis hypogoea*)	Cash crop	Most commonly grown on rotation on more impoverished patches.

Source: based on Prudencio, 1993.

The third ring, the bush fields, is usually devoted to millet which is intercropped either with white sorghum and/or cowpeas. There is no application of manure and other inputs are rare and consequently soil fertility is regenerated through fallowing. Legumes are often planted in rotation, or when soil fertility is very low. These fields tend to maximise the cultivated land area as far as possible in relation to the available labour in the household, i.e. the more excess labour available in the household the larger the bush field, the less labour available the smaller the field. This field is the furthest away from the household and thus receives the lowest inputs, in terms of labour, management or fertiliser. If fertiliser is applied, it tends to be chemical fertiliser because of the transportation problems over the distances involved, i.e. manure is too heavy to be carried long distances. The rotation cycles of crops in the third

ring are the longest, from 120 to 180 days. Prudencio (1979:253) shows that the third rings cover approximately 60 to 70 percent of the total household cultivated area but only provide 30 to 40 percent of total crop output.

Table 4.3 Crops and their roles in the third ring/bush field

Crop	Role	Comments
Millet (*P. typhoides)*	Provision of households preferred staple carbohydrate	Millet can tolerate poor soils and little management, it is often intercropped with cowpeas.
White sorghum (*Sorghum vulgare*)	Provision of staple cereal	White sorghum is less tolerant of poor soils than millet and so tends to be cropped on the better soils, again intercropped with cowpeas.
Bambara nuts (*V.subterranea*)	Cash crop and/or food crop supplement	Grown on the poorer soils.
Groundnuts (*Arachis hypogoea*)	Cash crop	Grown on the infertile soils in an attempt for a last crop.
Cowpeas (*V.sinensis*)	Provision of protein and base for sauces	Cowpeas can be grown here because of the lower risk of attack by animals (cowpeas are very palatable) if they are hidden in amongst the taller millet or sorghum.

Source: based on Prudencio, 1993.

In the Mossi ring management system there is a negative correlation between inputs and proximity to the household, i.e. the further away from the household the less inputs. More time is spent in the inner ring on activities such as manure application, soil preparation, weeding, harvesting, sometimes fencing, and also the timing of these activities are more precise here compared with the outer rings. For maximum yields with the inner rings it is necessary to have them as near to the compound as possible to ensure ease of access and often frequent surveillance. The closer the field is to the compound the better it can be managed (Marchal, 1982).

The crops that are chosen for each of the rings have different requirements in their sowing, first weedings and harvesting. In this way the farmer plants crops with different rotation times (i.e. from the time of sowing to the time of harvest) to avoid labour bottlenecks and also to ensure a staggered harvest in the agricultural calendar. For example, Prudencio

(1993:249) showed that between planting and first weeding was 18 days in the first ring, 26 days in the second and 35 days in the third ring; all of these lags were due to the differences in the maturity periods. In the same research Prudencio shows that maize in the first ring was harvested on average 66 days after planting, red sorghum in the second ring was harvested 137 days after planting and the millet and white sorghum was harvested on average 161 days after planting. These field level strategies employed by the farmers serve the purpose of ensuring food security at minimum risk and enabling farmers to minimise moisture and labour constraints and to minimise gaps in food availability over time (Kowal and Kassam, 1978). To be able to put into operation the maximisation of food security and availability the farmer must be able to plant a range of food crops that have different rotation cycles.

A vital aspect of this ring management system to realise is that soil fertility is positively related to the intensity of landuse. Far from destroying soil fertility through an over intensive period of exploitation, the farmer actually improves the condition of the soil through their management techniques. The further the distance the field is from the household, the lower the intensity management regime and the poorer the quality of the soils. Here management relies on fallowing to reconstitute soil fertility.

To end this section it is useful to return to Prudencio (1993:260) who makes two very important conclusions. Firstly, he states that population pressure is shortening the fallow period and this is causing a decline in soil fertility in *the outer* ring or bush field. Secondly, he states that,

> *"there is little evidence...supporting the conventional argument that traditional farming systems...mine the natural fertility base of soils when they evolve toward more permanent cultivation practices".*

4.3 The Fulani

The Fulani are the third ethnic group in Sissili whose traditional domain has been in the sahelian zone of Burkina Faso. They are a semi-nomadic group who have always covered large distances with their animals for trade and for grazing. Since the 1970s, they have

moved down from the Sahel into the greener southern zones in search of pasture. Pastoralism is a new arrival in the province and the management systems remain largely unknown

In each village, the Fulani inhabit a relatively isolated area of the village territory, away from the Mossi and Nuni fields. Their living quarters are referred to as encampments which are geographically distinct clusters of woven straw huts. These encampments are open, i.e. they are not enclosed by a wall like the Mossi or Nuni, but the areas which immediately surround the huts are swept and kept clean and provide the living area.

Fulani are agro-pastoralists, cultivating cereals on old pasture zones, providing part of the family's cereal needs for the year. Fulani fields are always located around their encampments, in a singular circular field. These are normally situated on old paddocks, i.e. the fields were previously used as cattle corrals which are rich in manure. In the dry season, corrals may frequently be moved around the future farmed area to fertilise as much land as possible and to minimise the labour required to spread manure onto fields. Their harvests do not provide the family with cereals for the entire year because of the small surface area farmed. Their harvest can provide food from anything between 6 to 9 months of the year depending on various factors. For the rest of the year, they buy cereals with money from the sale of cattle. There is a smaller crop variety on Fulani farms, in contrast to Nuni and Mossi crop mixtures, which is usually dominated by millet. When asked, a Fulani will always value his herd more than cropping, even though the harvest plays an important role in family nutrition. Agriculture is seen as a side issue and is carried out to take pressure off the herd. The Fulani have said that when pasture becomes poor they will go elsewhere; to increase the farmed area and to become more dependent on the harvest is not an option for 'real' herders. Their cattle are kept around the Fulani settlement (in a radius of 20 km) and are only taken for longer distances relatively late into the dry season, from March to May/June (transhumance requires one man to herd from between 15 to 20 cattle (Delgado, 1979:38)) when grazing is particularly difficult to find (see table 4.4 for the Fulani yearly activities). For the rest of the year the cattle are held in corrals made from dead thorny branches, around the encampment. Cattle are grazed on unoccupied land during the cropping season, on harvested fields post-

harvest, and in the valley bottoms during the hot dry period from March to June (Egging, 1989).

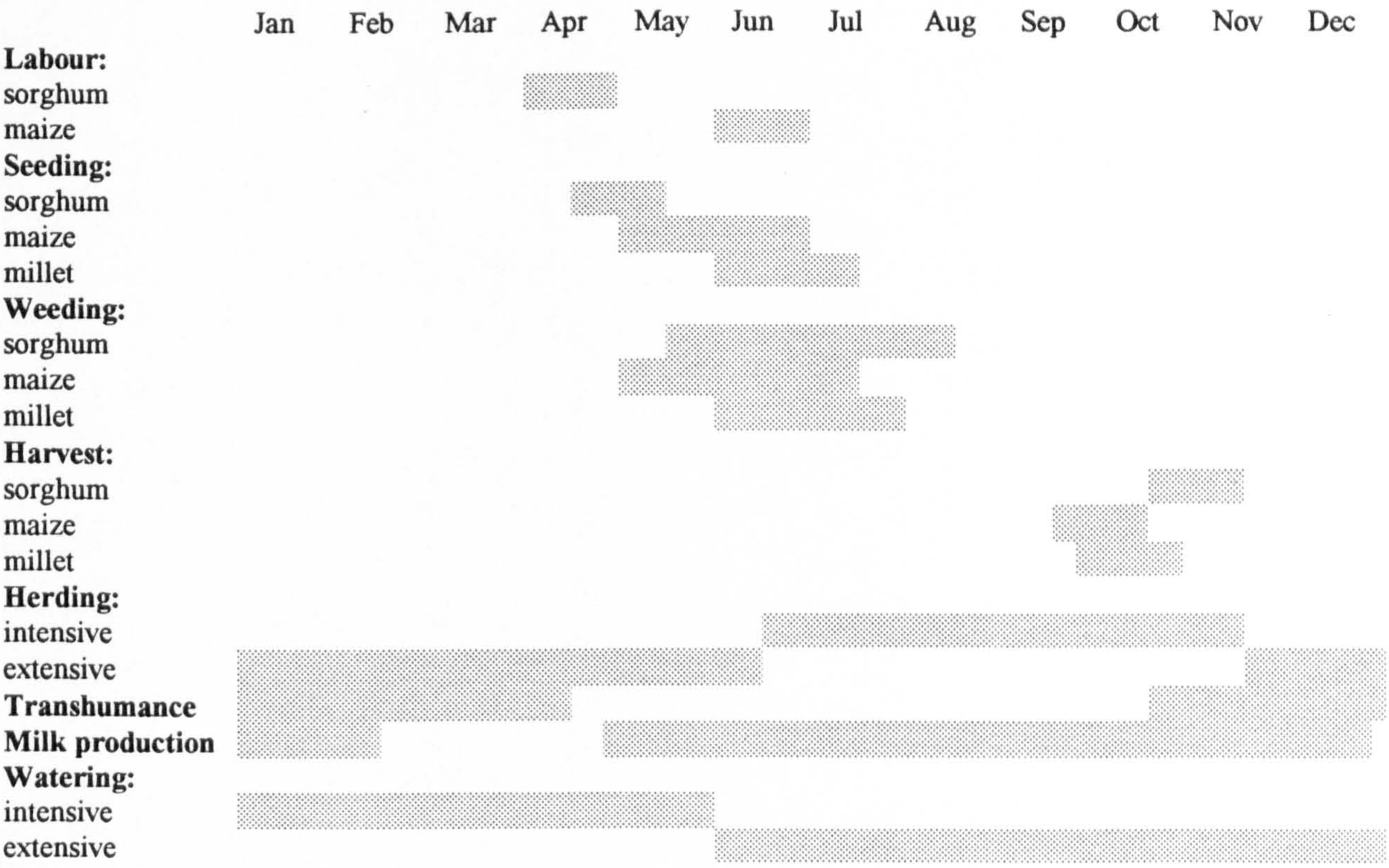
Table 4.4 The Fulani yearly activities

Fulfulbé name and period	Activities
Dungu - late June to mid-September (rainy season).	The herd is grazed near the encampment but away from cultivated fields. Forage and water are abundant but substantial work must be spent tending crops and moving the corral to control parasites. This is the best time for milk production.
Yamde - after the harvest to cold period beginning in December. **Nyaile** is the end of this period when livestock graze on crop stubble on nearby fields.	This is the time of plenty as the harvest is in and the cattle are fattened after grazing on the rainy season grasses.
Dabunde - the cold dry season from December to February.	Cereals are threshed with the help of the dry harmattan winds from the north-east. Cattle may be taken on to the Mossi or Nuni fields as crop stubble becomes scarcer. Manure from the corrals is spread over Fulani fields. There is no longer surplus milk for consumption by the household.
Cheedu - hot dry season from February to April.	Surface water is gone so wells must be dug in the valley bottoms. Around March, most of the herds have left on transhumance to distances of up to 60 or 70 km.
Seeto - after the '*pluits des mangues*' in April to the beginning of the rains in May/June.	All the herds are away in search of water and pasture and the cattle mortality is at its peak due to heat stress and lack of forage. The herds then return to the village for the first shoots of the rains. This is the reason why Fulani will plant later than their sedentary neighbours.

Source: adapted from Delgado, 1979:35-36

Table 4.5 gives a detailed outline of the average Fulani yearly activities.

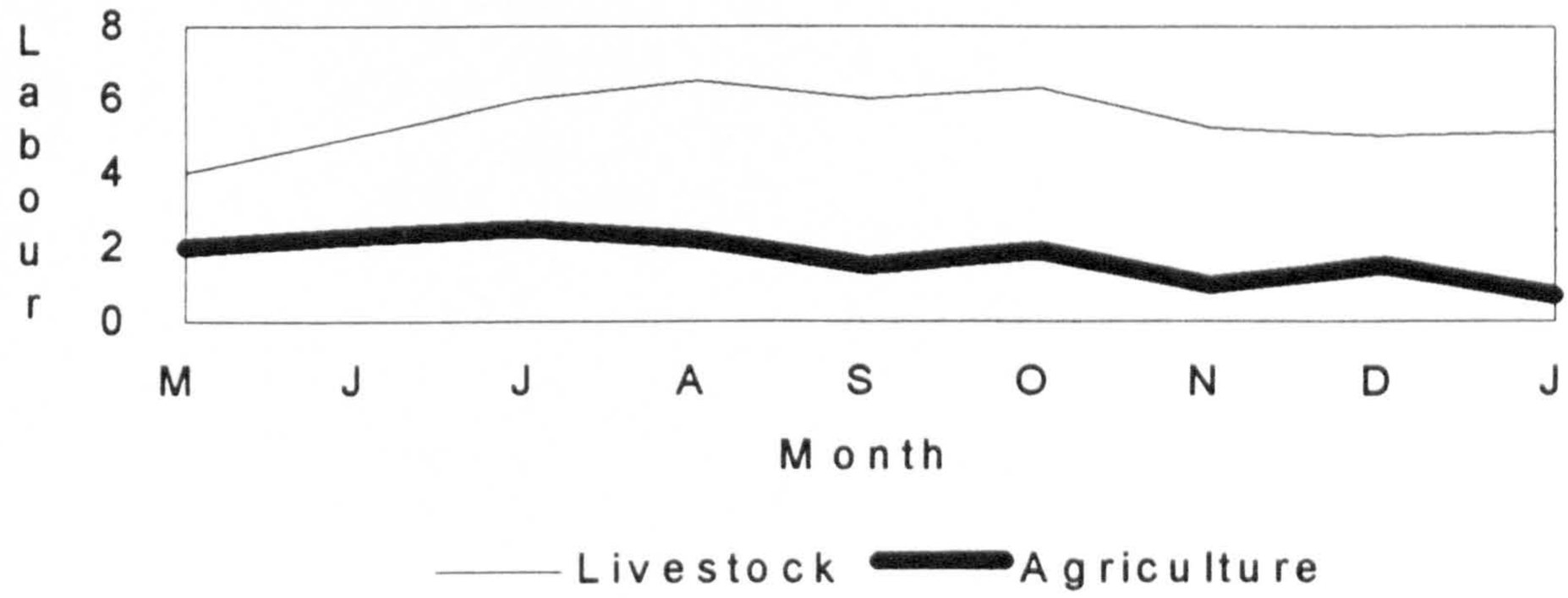
Table 4.5 The Fulani seasonal calendar



Source: de Boer, 1992.

Figure 4.5 illustrates the differences in labour requirements of the Fulani herding/livestock activities and the agricultural activities.

Figure 4.5 Relative labour allocation for livestock and agriculture amongst the Fulani



Source: based on Delgado, 1979

Fulani will guard and herd the animals of the Mossi or Nuni. For this they will receive no formal payment but may receive gifts (for example, cereals, clothes or a calf) and can use or sell the milk from the guarded animals (see box 4.3). As the sale of milk plays a vital role in the Fulani economy, guarding other peoples' cattle is an important contribution to household security. In addition to the milk other peoples' cows produce, they also produce extra valuable manure which can be used on Fulani fields or exchanged to manure the dry season gardens of the Nuni and Mossi. Cows from other people can make-up up to a third of a Fulani's herd. It is often Fulani who have recently lost a portion of the herd or who only have a few animals that will guard the animals of others. A Fulani without cattle or few cattle is not considered a 'real' Fulani. Richer or older Fulani may pay guardians to herd their cattle, the price for a six month period being 2500 FCFA (about the price of a Taurin calf of six months). Some exchange takes place at the village level, exchange of milk for cereals or use of village materials (e.g. mortar and pestle and grinding stones).

Box 4.3 Roles and responsibilities of Fulani herders

The relationship between the herder and the owner of the cow(s) is intrinsically based on trust on the side of the owner. Even though all management decisions are made by the herder with final approval by the owner, the herder is generally given free rein to do as he sees fit. The following are a few examples of the types of decisions made.

- Purchases and sales of animals are carried out on request by the owner, with the owner generally trusting the herder in his decision of price and in his location of a buyer and a seller;
- When the animal is sick, the future of the animal is decided upon by the herder, who may sell the cow (often at one fifth of the normal price) or visit a Vet (and the owner will have to pay fees).
- When a sick animal dies and is close enough to the owner, the herder will bring the animal's head as proof of death to the owner;
- The herder can begin milking when he judges fit and can also wean a calf off milk when he likes, without informing the owner;
- The herder must inform the owner of all births;
- When herders leave on transhumance, the herd is then under the full control of the herder and management decisions cannot be relayed to the owner. If an animal dies, its head cannot be taken back to the owner.

Source: based on research by Delgado, 1979.

There are two types of cattle, the Zebu and the Taurin (or N'Dama) which is without the hump and smaller, more adapted to humid environments and more resistant to trypanosomiasis. These are found more often with the Nuni and the Mossi. Taurins are more

resilient in famine conditions, they give more meat, do not get lost as easily as Zebu (they follow the herd and herder) and do not graze at night so are easier to guard and less demanding, spending the night in stalls. The Taurins however produce less milk and the price per head is lower than the Zebu.

The cattle that do not belong to other proprietors in the corral all belong to the head of the household. However, each member can 'own' cattle within the household herd, in the same way that a car may belong to a teenager, even though it is registered in his parent's name (Delgado, 1979:31). The head of the household has the power to sell all the cattle of the household if he so wishes, (Dahl and Hjort, 1976) although such an act would cause considerable dissent in his family if it was not in a time of crisis. When children marry, however, whether male or female, they can remove the cattle from the father's corral and take full control over those cattle. Women also can own cattle, given to them by their mother and father. The woman retains the right to sell her cattle, although she must gain permission from her husband first. The son of the mother also has rights to her herd, and the father, in times of need, can ask the son to try and persuade the mother to sell. If there is a divorce, the woman keeps the goods or gifts that she has received from the marriage, for example jewellery[12] which can be worth between 150,000 to 300,000 FCFA, in addition to her herd.

There are five legal[13] ways of acquiring ownership of cattle in Fulani communities (after Delgado, 1979):

- Inheritance from a parent;
- gifts from a father or a maternal uncle to a child;
- gifts from a proprietor of cattle for herding services;
- acquisition from a son-in-law as dowry;
- purchase of young cattle with the proceeds from the sale of old stock.

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[12] Fulani women wear a considerable amount of jewellery in the form of silver coins, plaited into their hair and silver chains around their necks and thick silver bangles.

[13] Of course, the illegal way to acquire cattle is theft. In the last three months of the research several cattle were stolen by Fulani in the village of Boutiourou that belonged to both Mossi and Nuni. They were thought to have been taken to Ghana for sale. The culprits were not apprehended whilst I was there, although considering the effectiveness of the village group in regulating village affairs, I would expect by now a solution has been found.

The Mossi and the Nuni have different reasons for animal rearing, for the most part they keep animals as a form of 'savings account' and for farm labour. Cattle herds are a good way of investing surplus money for the future. It has occurred in the past that Nuni or Mossi have sold all their animals and then they have reinvested when the threat have passed (de Boer, 1992). A Fulani would never sell all his herd and so risk of complete cattle loss from epidemics is high and consequently Fulani must invest in vaccinations. Small ruminants are kept by all tribes for small spending needs such as weddings, funerals or visitors. Manure from animals is rarely used or collected for compost for bush fields (except for the Fulani who farm on old pasture zones) but manure (household waste and manure) is used on household fields. Many people prefer and collect bat droppings for manure.

The favoured sale animals are male. The place of sale is often in the bush, with traders coming out to meet the Fulani and then returning with the animals to the butcher. There are disadvantages to this method; sellers cannot compare animals and prices and traders can misinform the seller of cattle prices. An advantage to this method is that sellers do not need to travel to the market, tiring their animals and risking a non-sale. Traders will often talk to people in the region asking which Fulani are in financial difficulty in order to secure cattle at cheaper prices, or they will follow Government vaccination programmes, approaching poor Fulani and offering to pay for vaccinations in exchange for cattle (de Boer and Kessler, 1994). Sale can also be carried out through intermediaries.

Because Fulani do not produce enough cereals themselves for the year, they are forced to sell some animals to buy the remainder. Towards to end of the dry season, the crops are at their highest prices (a 100 kg bag of millet costs 14,000 FCFA) and the cattle are at their worst condition and thus lowest price. At the end of the rainy season the crops are at their lowest price, 6/7,000 FCFA for the 100 kg bag of millet, and the cattle in their best condition and highest price. However, at this time the Fulani have also just harvested their crops and so do not feel the 'need' to buy. They will wait until the end of the season and then will sell two or three times the number of animals for the same amount of cereals. This situation is aggravated in drought years where their harvest is already poor. There is little

grazing for their animals which become thin very quickly and crop prices are very high; it is years like this where they risk losing their whole herd or where the majority is lost.

Understanding between the Fulani and the Mossi and Nuni is usually good, except when animals stray onto fields. Agreements often exist between farmers where the Fulani will graze their herds on the millet stalks after harvest and so fertilising the field.

Table 4.6 The agricultural division of labour in Fulani communities

Men	Women
Planting Weeding Field preparation Harvesting Threshing Manuring Herding	Help with: manuring, removing grains from cereal heads. Maize cultivation Milking Preparation of milk products

Source: Author's fieldwork, 1993-1995.

The Fulani farming system, although much smaller in magnitude than both the Mossi or Nuni, is made more intensive through the application of cattle manure. This allows the Fulani farmer to realise significantly higher yields per unit of land than the other two tribes. However, the Fulani farmer has significantly smaller land parcels. In figure 4.6, there is a comparison between peasant farmers and Fulani households allocation of labour hours to one hectare of land (based on research by Delgado, 1979). Even though it is taken from another area of Burkina Faso, the order of magnitude of difference is very similar.

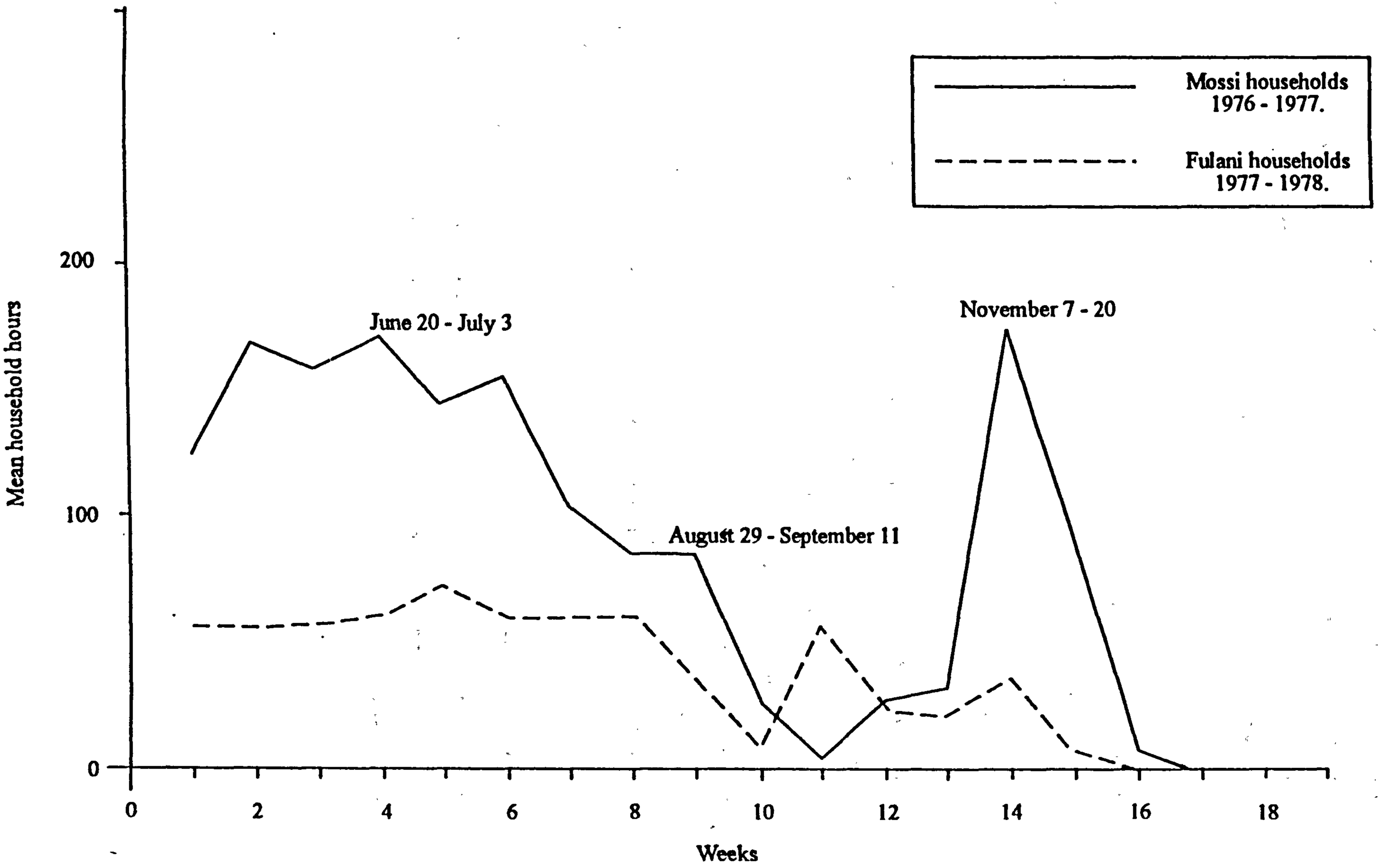
Occasionally Fulani cattle will wander onto a Mossi or Nuni field (more commonly a Mossi field as they tend to be in closer proximity to Fulani encampments). The outcome of this infringement depends on many factors, the most important being the level of crop damage incurred. An ensuing conflict then only arises if the owner of the cattle in question refuses to accept liability. In this case, the farmer can pursue a line of prosecution. Once the offending herd has been identified, the farmer makes an appeal for the redress of grievances to his village or canton chief. The chief will then send for the Fulani chief who is responsible for producing the offender and then securing the fines that the offender must pay. If the Fulani chief will not, or is unable to arrange this, a tribunal will be arranged in Léo, the provincial

capital. In the three case study villages, situations of this nature have always been resolved in village counsel. In part it reflects the authority of the Fulani chief to regulate and survey all Fulani activities in the village territories where they have been allowed to settle. The penalties for being held responsible in a crop damage case are sufficiently severe to ensure great care by the herdsmen during transhumance (Berger-Sarl, 1989).

In Delgado's research (1979:65) he compared the capital goods of the Fulani to two other sedentary tribes. He noted that the Fulani had a noticeably smaller average number of hatchets and machetes, but concluded that this was simply due to a smaller number of agricultural workers. He also noted that the number of granaries in a Fulani encampment was proportional to the field area and consequent harvest. Fulani capital also includes corrals, that the Nuni and Mossi do not have, but fundamentally most of Fulani capital is manifested in their livestock.

The Fulani herds are dominated by older animals which are retained because of their proven hardiness to drought and disease. Mature females commonly make up one half of the herd (of the Fulani portion) because of the profitability of breeding animals and their milk production capacity (Amanor, 1995). Household cattle herds grow larger through animal entrances due to births, entrustments or purchases; stock holdings diminish with deaths, losses, theft or sales. Household herds grow significantly in June due to the large number of births but also include additions by outsiders who have entrusted their cows to the Fulani (de Boer and Kessler, 1994). During October and November the number of animals decreases due to profit taking by peasant proprietors who take advantage of the yearly peak in animal prices at this time (Amanor, 1995). This is precisely the time when the Fulani are net purchasers of cattle (Delgado, 1979). This is because, unlike their sedentary neighbours who are willing to take the risk of buying cattle cheaply at the end of the dry season when mortality is high, they prefer to restock their herd with good quality cattle after the rains so they can be grazed by the owner for at least six months before the hard dry season. They will also sell cattle, at a much diminished cost in the middle or end of the dry season (depending on when their grain stores finish), to purchase grain to see them through to the next harvest (food items make up one half of the Fulani's annual expenditure).

Figure 4.6 A comparison between farmer's and Fulani labour allocation for agriculture



Source: Delgado, 1979

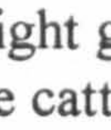
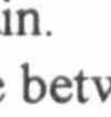
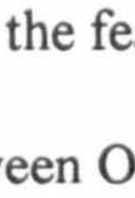
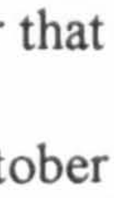
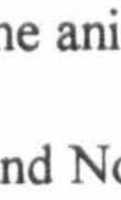
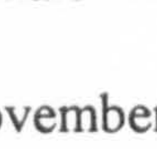
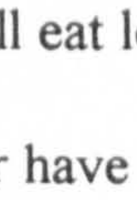
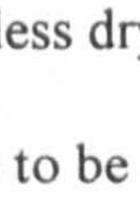
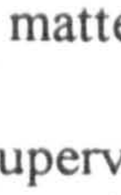
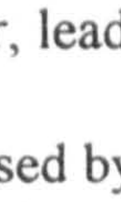
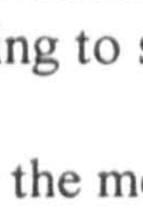
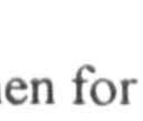
Delgado (1979:89) identifies another four areas of economic activity: the sale of milk; the sale of small ruminants (sheep and goats); the sale of eggs and poultry; and miscellaneous payments for herding services or the provision of cattle manure. The consumption of meat (cattle, sheep or goat) for subsistence is rare (as seen in the village case studies) although animals will be slaughtered for Muslim festivals, including Ramadam, Mouloud and Tabaski.

Milk plays an important part of the Fulani household's diet and only the surplus is sold. The collection and marketing of the milk products (sold in callabasses in the form of a yoghurt-like curdled milk which keeps well in the heat) is controlled solely by Fulani women (as is the judgement whether there is a surplus). Surplus milk depends on many things including the number and health of female cattle and the number of consumers in the household.

Small ruminants are a faster maturing and a more accessible form of capital than cattle. Van Raay (1975:97) concludes that one small ruminant is equivalent to one seventh of a steer, while computing forage requirements, which is the same ratio between the prices of three year old animals of each species. Sheep and goats are used for many cash oriented purposes such as sale in emergencies, to buy medicine in times of sickness, to buy occasional luxuries such as a radio or new clothes; gifts to in-laws or parents; or for slaughter in ceremonies. Poultry are used for presents or for entertaining visitors, eggs are sold for pocket money or to buy sauce ingredients.

Delgado (1979:104) concludes that the Fulani household cash income and expenditure is one of a production system which is dependent on the market to convert livestock into food items, principally staple cereals. Figure 4.7 shows the relative distribution of labour throughout the Fulani year. There are descriptions on the figure of critical events in the pastoral and agricultural calendars.

Figure 4.7 The Fulani seasonal labour calendar in Sissili

Descrip-tor			1				2	3		4		5
Labour												
Month	J	F	M	A	M	J	J	A	S	O	N	D

Source: based on, de Boer (1992), de Boer and Kessler (1994) and Delgado (1979).

1 Male labour in March to May is to supply water to the cattle through sinking hand dug shallow wells.

2 High labour requirements in late July are due to weeding and close supervision of herds because of their proximity to crop fields. Men are helped in herding at this time by boys, girls and, sometimes, elders.

3 More work is needed in August to stop the cattle eating wetter grasses. Van Raay (1975:110) reports that this reflects a concern about diseases that are connected with wet forage and the fear that the animals will eat less dry matter, leading to smaller weight gain.

4 The cattle between October and November have to be supervised by the men for longer than usual because of the need for longer grazing periods.

5 Between December and February the herds are taken care of by small boys, from March to November they are in the charge of men.

4.4 Summary and conclusion

The Nuni have a strong relationship with their land that has developed over many years. This relationship has developed, not in a static situation, but in a dynamic, forever changing environment. There have been various wars, invasions, droughts and epidemics which has meant that the Nuni communities have had to be inventive and adaptive in their resource use patterns and survival strategies. The current resource use pattern is the result of generations of adaptation which has again recently evolved to incorporate another two ethnic groups and their production systems. The new resource use pattern is slowly emerging.

The recent history of the Mossi is not significantly removed from their historical background, i.e. the Mossi have always moved. When there is movement, accompanied by settlement, there are two processes which occur. Firstly, they bring their farming systems that they have employed in their zones of departure and, secondly, they adopt local farming

practices. In this way their farming systems are always evolving and developing in response to local conditions. Although there are many similarities between Mossi immigrants and their processes in the *Hauts Bassins* and those in Sissili, they are by no means the same because the local socio-economic and ecological conditions are dissimilar. The Mossi are now learning from the Nuni, and *vice versa*, to develop new resource use patterns that ensure livelihoods for the entire community.

The Fulani have a very different production system than those of the Mossi and Nuni and as a result remain relatively isolated from their neighbours. This is principally because grazing cattle and unprotected crops do not mix (the Fulani fence their own animals in the presence of their own crops). There does exist, however, a significant level of trade and exchange between the Fulani and the other ethnic groups which allows a level of assimilation and integration into the wider social system. Thus, on one hand, the Fulani appear to keep themselves to themselves, but on the other, they are an integral part of the developing tri-cultural framework.

The three cultural profiles illustrate the differences between the three ethnic groups. They each have different histories, production patterns and social relations. However, they all now share the same land area and they all share the same production objective; to guarantee subsistence, ensure survival and minimise risk. It is in this context that this study examines the process of local management of the natural resources in Sissili, i.e. the process of the development of production systems in Sissili in the context of three very different ethnic groups. In the following three chapters, three village case studies are presented. In each village there are the three ethnic groups. The complexity of the situation denies the ability to produce blanket commentaries and conclusions on production patterns in the region. Each situation must be looked at in detail in order to understand process and form.

5. VILLAGE CASE STUDY ONE: LON

Chapter overview

This chapter presents the first of the village case studies. The village of Lon is the biggest of the three villages and the furthest north, the other two case study villages are smaller and more southerly. Section 5.1 introduces Lon and how the village territory has experienced change since the 1950s. Section 5.2 discusses the production and tenure system in the village and 5.3 analyses the legal arrangements and the administration of the territory. Sections 5.4, 5.5 and 5.6 present the production systems of the Nuni, Mossi and Fulani respectively and finally, 5.7 discusses the ethnic interrelationships.

5.1 Lon

5.1.1 Introduction

Lon is the most densely populated village of the three case study villages and experiences the highest resource shortages and problems of production. Lon has a territory which covers an area of approximately 26 km^2. It is in the middle of a big settlement network and is surrounded by the villages of Tabou (a medium sized market town and a cross-roads) to the south west, Tô (a big market town with a high concentration of Mossi) to the east, Poré to the north east, Tiabouana to the north west, Panassin to the east and Niéssin to the south east. The Nuni have links as a result of parentage and marriage to Cassou (the administrative centre for Lon and thus an advantageous town in which to have links), Tabou, Tô, Bonapio, Panassin, Nevri and Pouri. The villagers of Lon, both immigrant and local have a large and complex social network.

Box 5.1 The oral history of Lon

The village of Lon is named after a type of grass and is said to be 800 years old. The founder of Lon was a great hunter called Boumain Napon and he came from Tassyin near Biéha with his animal herd and arrived at Nevri. Here there was a disagreement between him and the villagers, so Boumain left for the village of Gniga. At Gniga he met Bazao Bénao who became his animal herder and they settled at Badakui which means 'the place of the brave'. Bazao left Badakui and for three days he did not return so Boumain went to look for him and his animals. Boumain found him towards the west and asked him why had he not returned. Bazao said that there was a grass here that the animals like so much that they would not leave the spot. The name of the grass is **lon** and is the same grass that is used to make the flights of arrows. When it rained the animals would shelter under a large tree called **janlon** and so Boumain built a grass hut under this tree and gave his permission to Bazao that he could look after his herd and settle there, in the new village of **Lon**.

Boumain then left for the village of Yillou in the Mossi plateau where he killed an elephant that was stopping the villagers from getting water from the river. When he had killed the elephant he cut off its tail to prove to the chief of Yillou that he had done the deed. The chief had then told the villagers to go and get the meat of the elephant to eat. When the meat was ready Boumain refused to eat. The chief then gave Boumain one of his daughters called Katian that he married and took back to Badakui. Here he had two daughters and he gave one of his daughters for the bride of his animal herder, Bazao, who remained ever grateful. Today, this allegiance continues. When there is a problem at Lon, they come to Badakui to resolve it. Even if someone dies at Lon they will not bury them unless they ask the chief from Badakui first.

Source: Author's fieldwork, 1994.

As the oral history partly explains (box 5.1), the village is an amalgamation of two villages: Lon and Badakui. Badakui was the original village which the elders say is 800 years old, and Lon was an offshoot of this. All the political and legal control is held in Badakui. Due to the large population, the village chief has delegated control over to the formal administration based in the departmental capital of Cassou for many social problems, petty crimes and

grievances. The chief, however, still controls land allocation and still presides over land matters. The traditional leaders of Badakui still oversee social activities when required to but they do not travel out of their way to do so.

5.1.2 Population

The population, according to the most recent population census (*Ministère du Plan et de la Cooperation*, 1988) was 2,978 in 1985, which makes it by far the most highly populated of all the case study villages. The Nuni elders presently estimate that there are approximately 400 to 500 Mossi families and 10 Fulani families that arrived 30 years ago and 10 years ago respectively. They moved to Sissili from the northern areas because of drought, poor pasture and poor soils.

Lon has 12 cantons; six Mossi cantons, four Nuni and two Fulani camps. The table below gives the name and origin of the canton leader or chief.

Table 5.1 The cantons of Lon, 1995

Canton name	Name of canton leader	Position
Badakui	Napon, Amidou (N)	Land and village chief
Saolia	Benao, Naloan (N)	Family head
Nignanliassan[1]	Nignan, Maroul (N)	Family head
Zioliassan	Zio, Sapouri (N)	Family head
Mané	Lassané (M)	Mossi chief (Ouahigouya)
Yarcé	Soumaila (M)	Canton chief
Kalsaka	Boureima (M)	Canton chief (Koudougou)
Ouagadougou	Madi (M)	Canton chief (Ouagadougou)
Koudougou	Boukary (M)	Canton chief
Daboua	Souliman (M)	Canton chief
Ouanogo (Badakui)	Aila (F)	Fulani chief
Nossésan (Lon)	Nossé (F)	Fulani chief

(N - Nuni, M - Mossi, F - Fulani)

Source: Author's fieldwork, 1993-1995.

[1] 'liasan' means 'the abode of' in Nuni.

5.1.3 Description of the landscape

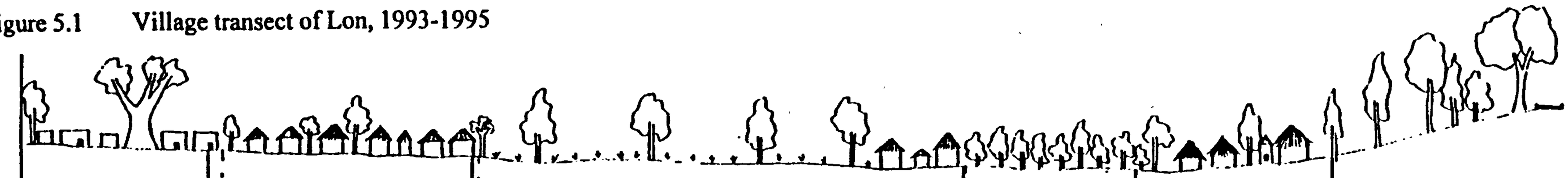
The transect (figure 5.1) is taken from Badakui to the original site of Lon (the big tree under which Boumain built the grass hut for Bazao). The flatness of the topography, in comparison to the other transects is because the area is in a low lying area. North of the transect is the valley bottom. In contrast to the other transects, it is evident that Lon's local environment has been much more heavily influenced by human activity; habitation occupies much of the transect with the exception of a small band of trees to the right of the figure.

On the left hand side of the transect is the original Nuni settlement of Badakui and the houses seen are those of the village chief. Around this habitation zone are found trees and shrubs of high value, both exotics and indigenous species.

These include the bamboo that is used for long poles which are used by the women to knock mangoes or karité nuts from the high branches of trees; the neem tree (*Azadirachta indica*) used for 'toothbrushes', i.e. sticks are rubbed on the teeth (neem has antiseptic properties); *Parkinsonia aculeata* used for thorny fencing; and *Khaya senegalensis* used for local medicine and shade.

Next to this, on the right, there is a Mossi settlement and its household fields. Again, there are a number of high value trees including baobab, mango and guava. On the household fields there are red sorghum, millet, maize, niébé and cowpeas. Next to this are the Mossi's village fields which are cultivated with millet and are mixed with fallow. There is a low tree species count but those left are again the high value trees; karité, néré, *kapokiér* and *V.donniana*. There are approximately 30 trees per hectare and some degraded patches where localised soil erosion can be seen. After another small Mossi residential area, there is the forested section. Here is found the most dense and species diverse section of the transect made up of primarily 'bush' species, i.e. those that local people would not conserve around their compounds, (néré are not usually kept around the compound because of their high leaf litter, dirtying the courtyard and providing cover for snakes and scorpions). This section makes up a buffer zone between the Badakui area and the Lon area and provides some pasture and a gathering area.

Figure 5.1 Village transect of Lon, 1993-1995



Trees and Shrubs	Azadirachta indica Adansonia digitata Khaya seuegalensis Cassia siberiana Butyrospermum parkii Bamboo Parkinsonia aculeata Mangifera indica Lannea microcarpa	Parkia biglobosa Butyrospermum parkii Diospyros mespiliformis Combretum glutinosum Afzelia africana Adansonia digitata Mangifera indica Psidium guajava Combretum glutinosum	Parkia biglobosa Butyrospermum parkii Vitex doniana Bombax costatum	Parkia biglobosa Khaya senegalensis Piliostigma reticulatum Lannea microcarpa Pterocarpus erinaceus Prosopis africana Combretum glutinosum Ximenia americana Diospyros mespiliformis Cassia siberiana	Parkia biglobosa Butyrospermum parkii Bombax costatum Diospyros mespiliformis Lannea microcarpa Calotropis procera Mangifera indica Vitex doniana	Acacia albida Diospyros mespiliformis Lannea acida Lannea microcarpa Balanites aegyptica Piliostigma reticulatum Combretum glutinosum Acacia macrostachya Ficus gnaphalocarpa Parkia biglobosa
Remarks	House of the Nuni Village Chief: the original settlement of Badakiri	Mossi settlement and their household fields: maize, millet, sorghum, niébé, cowpeas	Mossi village fields with mixed fallow, millet and finger millet, approximately 30 trees per hectare, including partly degraded patches	Forested section 100/150m	Soils of the valley bottom and Mossi settlements	Road, trees interspersed with bare patches and laterite gravel patches of erosion

Source: Author's fieldwork, 1994

The adjoining area is another Mossi settlement which leads up to the slope where the original site of Lon is situated.

5.1.4 Evolution of the farmed area

The three diagrams (figure 5.2) show the evolution of occupied space from 1955 to 1983 to 1993. Diagram one and two are based on aerial photographs taken by the flights; Mission AOF 006 NC 30XXII (1955) and Mission AOF 024 NC 30XXIII (1983). The third is taken from a landuse map (IBS, 1994) that was based on Landsat images from November 1988 and Spot images from December 1993.

Like the other case study villages, the situation in 1955 was characterised by very small indigenous Nuni population inhabiting a large land area with high percentage cover of natural savanna bushland. On the 1955 map, there are two settlement areas; Lon and Badakui. The fields around Badakui belong to the Badakui Nuni that are based around the Nuni chief's compound (the Napon family) seen on the left hand side of the transect. Likewise the fields around Lon belong to the Nuni of Lon who are members of the Bénao family. The fields to the west of the map, to the north of the stream on the lower slopes, are fields of families from Tô. The field to the south west belongs to a family from Tabou and the field to the north east is of unknown origin but may belong to a family from Panassin.

By 1985, the picture has radically changed. There has been a significant influx of people from the Mossi plateau and the population has increased far past the natural population growth rate. As the first immigrants arrived in 1975, the picture of occupation seen in 1983 is a result of 20 years of further immigration and immigrant land exploitation. Even so, the Nuni have preserved much of the southern, eastern and northern zones as forest and land reserves, primarily for the Nuni and their children. The western and part of the southwestern area is a sacred forest reserve which no Mossi are allowed to exploit. Although a Fulani encampment has been permitted to set up camp in the eastern reserve as part of a conscious decision; the Nuni chiefs knowing that no Mossi will cultivate next to Fulani and their animals and also the knowledge that Fulani do not significantly damage the bush. There is

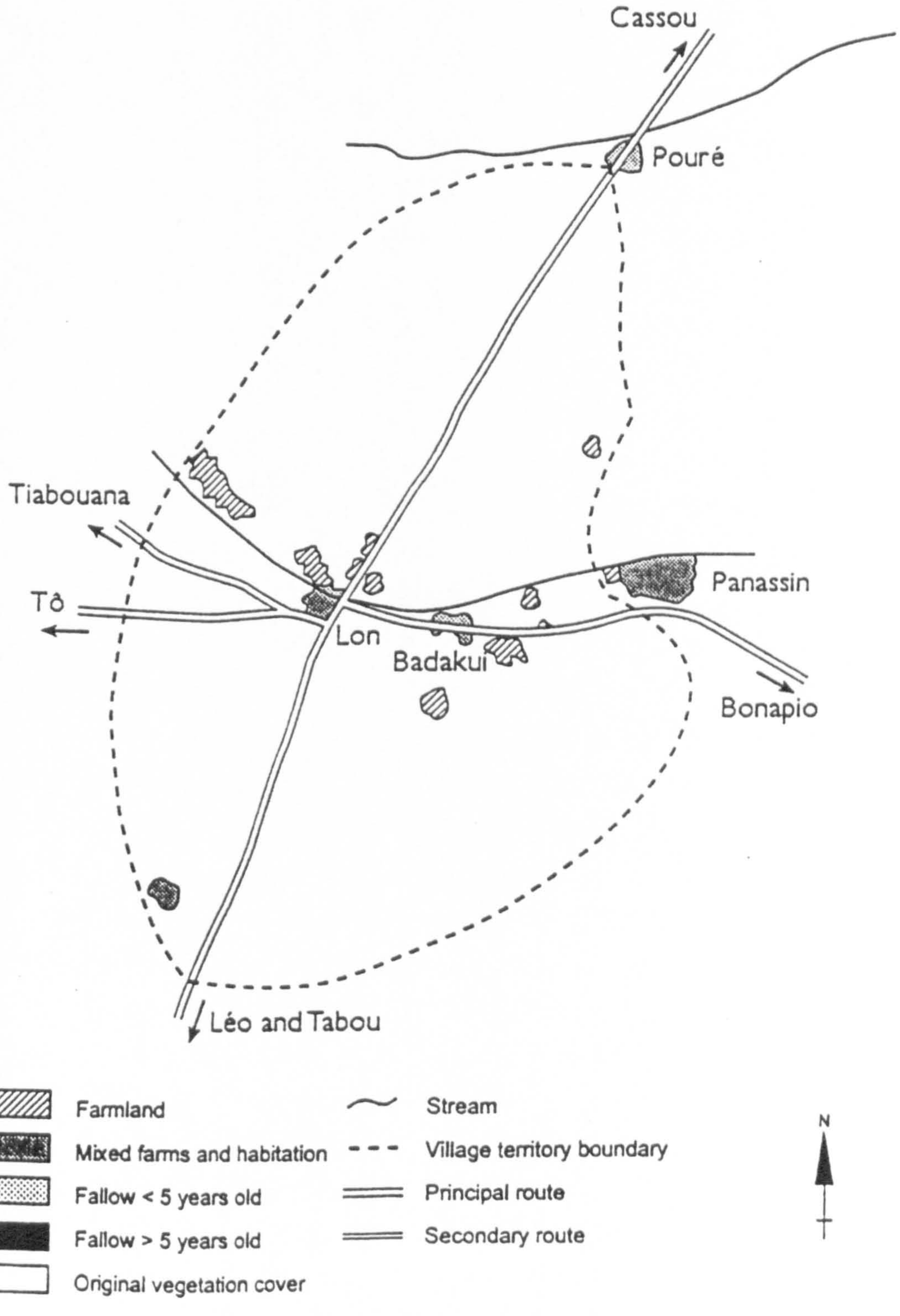
another Fulani encampment to the south who are from Louga in the north. They remain isolated and fulfil a bush protection role.

There are Mossi from a range of different origins in Lon's territory and they have all settled in different parts. The Mossi of Ouahigouya have settled in Badakui, these are the original Mossi of Lon that arrived in 1969 and consequently this lineage has become the dominant one and contains the Mossi chief. These Mossi can cultivate around their compounds, but outside of the immediate vicinity they must ask the Nuni chief at Badakui. The Mossi of Ouagadougou have settled in the northeast and the Mossi of Koudougou have settled to the northwest. The Mossi to the centrewest are from mixture of origins, some residing in Lon's territory, and other Mossi living on the periphery who are classified as Mossi from Tô. To the north west there are some fields of the Mossi from Tiabouana.

Presently, land continues to be fallowed and there are patches of woodland in amongst the Nuni and Mossi farms, enabling gathering to take place throughout the territory and not just in the forest reserves. It is has recently been shown (Schrekenberg, 1996) that fields and fallows provide most of non timber forest products in the West African Sahel. There also can be seen a significant increase in the number of connecting routes and paths which connect the farms and settlements together. There also can be seen a significant increase in the size of the neighbouring villages of Pouré and Panassin, illustrating the popularity of the region to Mossi immigrants.

Figure 5.2 The evolution of the landscape in Lon, 1955 to 1993[1].

A. 1955

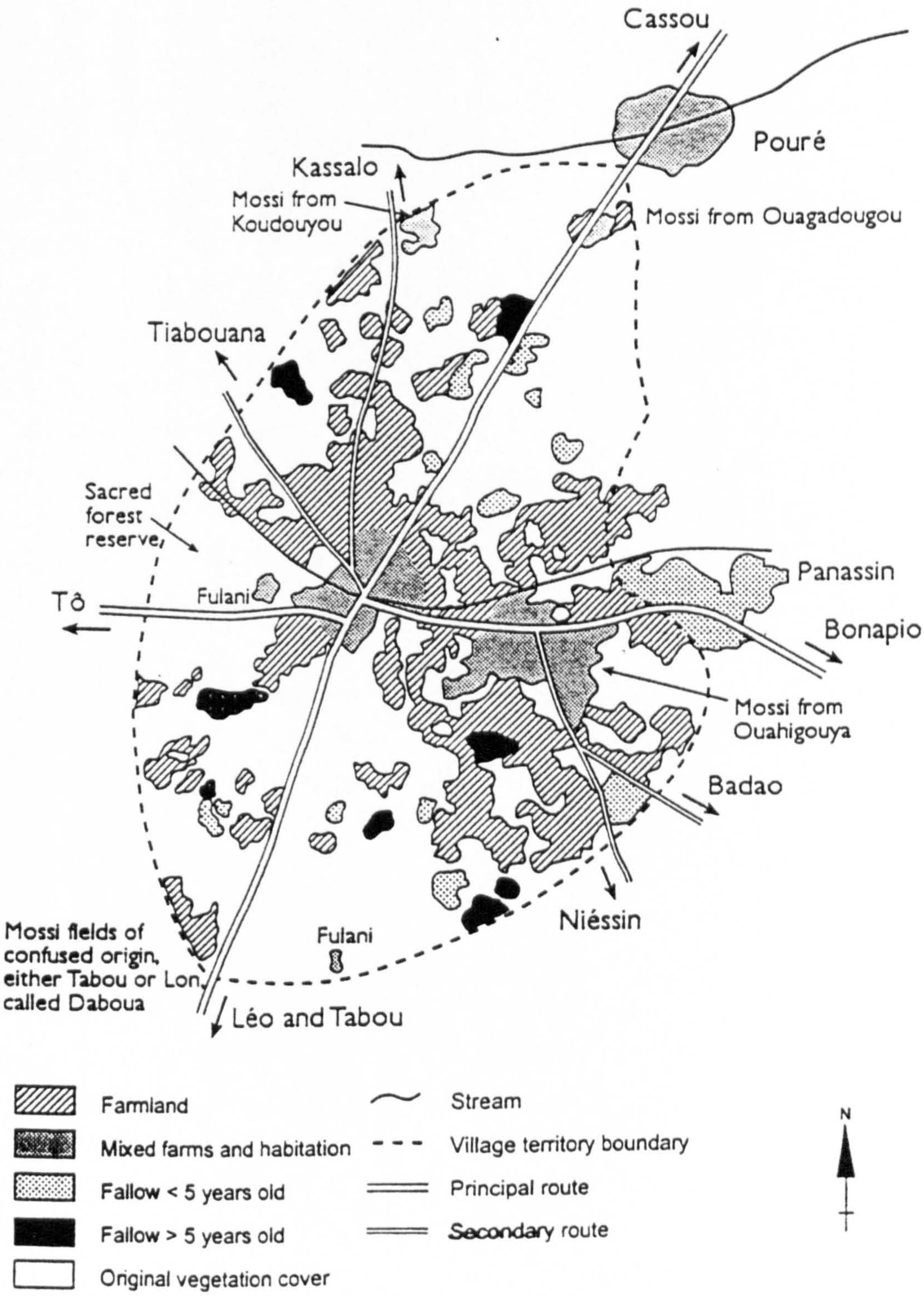


Maps are based on the interpretation of aerial photographs and maps and ground verification through interviews and observation, see text for explanation

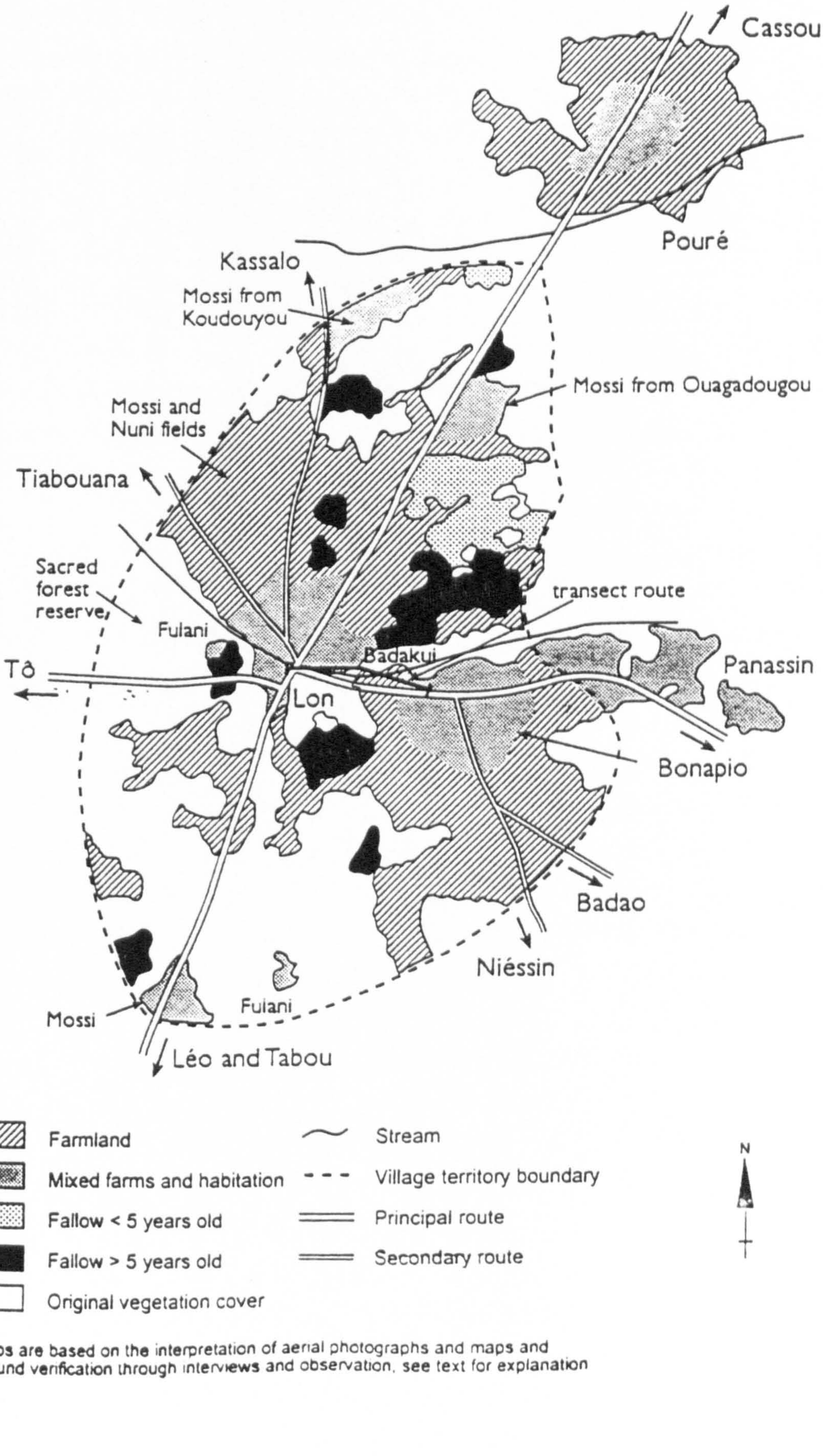
Source: Author's fieldwork, 1993-1995

[1] Not to scale.

B.1983



Maps are based on the interpretation of aerial photographs and maps and ground verification through interviews and observation, see text for explanation



Maps are based on the interpretation of aerial photographs and maps and ground verification through interviews and observation, see text for explanation

The 1993 map is of a less detailed nature due to its origin and there is likely to be scattered woodlands and bush in amongst the farmland shown. However, a number of things can be noted. Firstly, compared to the other villages there has only been a minimal expansion of land occupation in Lon; the farmed land has remained relatively static, since 1983. The east, north and southern areas that were reserved for future farming still remain to some extent there is some encroachment, especially in the east where a large part of the reserve has been cultivated although the 'sacred grove' remains intact. The Fulani to the south remain as 'guardians of the bush' . There is some forest regeneration to the east where fallows have been left and the patch of bush that separates Badakui from Lon also remains. It should be noted that the land demarcated as farm land is not devoid of trees, in a Nuni field as many as 40 to 50 trees may remain in one hectare and a Mossi field may count anything from one to 30.

The village of Pouri has grown remarkably due to Mossi immigrants while the land occupation of Panassin seems to have stabilised.

5.1.5 The future of the occupation of space in Lon

Although it is difficult to project future population growth, if immigration has stopped, then the occupation and use of the land in Lon will remain limited to the current resident population and their families. With over half of the territory in Lon still covered by woodland it is unlikely that, even with exponential resident population growth, the village will experience serious resource shortages in the near future. However, the author disagrees that African farmers are natural, even eager, 'soil miners', rather, they take rational, positive group and individual decisions concerning present and future resource use. As the farmers in Lon know well their available resources then it follows that their decisions concerning their use will be based on sustainability, i.e. the ability of the land to guarantee subsistence for them, their children and grandchildren.

Table 5.2 The growth in the different categories of land cover in Lon, 1955-1993[3]

Total land area - 2644 hectares

	1955 ha	% of area	1983 ha	% of area	1993 ha	% of area
Farmland	65	2.5	797	30	1200	45.4
Woodland	2579	97.5	1736	65.8	1198	45.2
Fallow <5 years	-	-	60	2.3	93	3.5
Fallow >5 years	-	-	51	1.9	153	5.9
Total	2644	100	2644	100	2644	100

5.2 The production and tenure system

5.2.1 Background

There are villages which have fields in Lon's territory. These are Tô which has 20 fields to the west, Tabou that has nine fields to the southwest, and Tiabouana which has 20 fields to the northeast. These fields are all fields of immigrants living in the other villages. Lon also has fields in other village territories. These are six fields between Pouri and Daboua opened up in 1991, and 12 fields in the territory of Tabou that started to be farmed in 1988. These are also immigrant (Mossi) fields. This, according to Mathieu (1994), is a common occurrence which has arisen due to the Mossi being given land of confused ownership. This brings land into production which may have never happened previously and thus contributes to the wider production system.

As discussed in chapter two, there are a range of soil types in the three case study villages. The Nuni elders of Lon recognise the soils presented in table 5.3. The soils that are unique to Lon include; **kapafounoutia, kapataotia, tebouatia** and **tesien.** These are of poor quality and are a result of location specific degraded patches.

[3] Based on the interpretation of the diagrams of the evolution of the occupation of space.

Table 5.3 The range of soils in Lon and their Nuni names[4]

Name of soil	Description
Kapafounoutia	"Gravely soil, found near hills, with few trees and undergrowth".
Kapataotia	"A soil with lots of gravel found towards Pouri".
Kasuloutia	"Very sandy soil, few trees and grasses, soil becomes infertile very quickly".
Tagatia	"A soil ideal for tuber production".
Tebouatia	"A soil of low productivity, resembling a termite hill".
Tekassoulou	"A very sandy soil".
Tesien	"A red soil with few trees which may be stunted and undergrowth".
Tezonou	"A fertile, black soil, with many trees of many species and abundant undergrowth".
Varatia	"A hard argillic soil, found in the valley bottom".

Source: Author's fieldwork, 1993-1995.

Agriculture takes place in most places in the village territory and on **tezonou, varatia** and **tekassoulou** soils and in the **pountia** areas, using a **daba** or a plough. Dry season gardening is practised near the valley bottom on **varatia** soils in the site that ADESSI helped set up . Here they grow cowpeas, okra, niébé, cabbage, wild aubergine and sorrel, using rudimentary tools e.g. buckets and calabasses. Animals are kept by most families and animals are taken to graze in the east and northwest of the territory up to a distance of three kilometres. Animals are taken out by the children of the household or the Fulani, who are given some payment or gifts. Animal rearing has now become an important economic activity compared to the past, although, the Nuni say it is expensive (because of the vaccines and animal medicine) but viable. Theft of animals, however, is increasing as a problem.

Forest gathering takes place around the houses, in the fields and fallows and in the bush and such things as wild grapes, néré, detarium, liana fruit, karité, tamarin and *kapokiér*. They are collected with the use of a long collecting stick and transported back to the household using a basket, bicycle, donkey cart or head pannier. People search up to seven kilometres to find the desired products and the Nuni say that now the products are less accessible. Previously it was solely a female activity but now men have become involved because, it has become an economic activity, i.e. the products are collected and sold, and also because the products have become harder to find. Similarly, it has become harder to find firewood and now people

[4] All the soil descriptions are translations from the words of the Nuni elders.

have to travel up to five kilometres to find enough wood. The problem is exacerbated by the recent arrival of woodfuel trucks coming from Ouagadougou to gather wood for urban buyers. When it was asked for a description of women's activities, a list of the 'dos and don'ts' was given: women do the housework, cook, wash the clothes, prepare néré flour, pound millet, make **soumbala**, make karité butter, make soap, fetch the water, help in seeding and harvesting, engage in petty trade, collect fruits and firewood and do the dry season gardening. Women cannot fire a bow and arrow, hunt or kill an animal. Men cannot make karité butter, **soumbala** or soap.

Hunting is no longer practised because all the wildlife has disappeared in the village territory.

5.2.2 Village organisation

There is a mixed men's group (Nuni and Mossi) in Badakui with 32 members who work together on common interest projects. For example, they work together on well digging, building construction, and collective farming. They also have an experimental field where they grow cotton and rice and the dry season garden is shared with the women's group. All the members of the group give 50 FCFA every two weeks for the group fund. For personal construction, i.e. building their own homes, the Nuni and Mossi will ask their neighbours for help and for farm work they farm in the family group. The **kampené** is also used in times of need by the Nuni. The Nuni say that in the past people used to work in larger family groups which is not the case today. They also say that the men's group is good for the village but sometimes the participation is poor.

The women also work collectively, both formally and informally. They have their own group, again, made up of both Nuni and Mossi of 85 members, which has its own collective groundnut field and also they share the dry season garden with the men's group. Each woman contributes 25 FCFA to the group fund every month. They hire themselves out at 5,000 FCFA per day. They also work together informally to carry out mutually beneficial work. This work includes, pounding cereals together in a large mortar with numerous pestles, they also collect water in groups, they have a karité nut bank where they collectively gather the nuts and deposit them in a central bank where all the women of the group have

access to nuts to make butter. They also work together to collect water for construction (brick making) and they farm together when necessary.

5.2.3 Support organisations in the village

As outlined in the following section, Lon has had several organisations supporting development activities. These include, World Relief (an American Catholic NGO) who have been in Lon since 1983, ADESSI who have worked in Lon since 1991 and *Sixiéme* FED's *Volet hydraulique* who attempted to sink boreholes in 1993 to 1994 but failed due to the low water table. There has been some exploratory work done by the *Sixiéme* FED's *Gestion de Terroirs* programme based in Cassou but they have so far only been involved in providing some seeds for a dry season garden. Previously there was an extension agent from the SPA living in Lon and working with the farmers in Lon and its surrounding villages. He left in 1995 because funding from *Sixiéme* FED (who were supporting the SPA's extended work programme) ended. Now Lon is served by the extension agent based at Cassou who visits once a fortnight. There is an extension agent from SPET who is based in Tabou but who rarely visits. Lon's proximity to the main road is a factor in external organisations working there.

5.2.4 Village resources and infrastructure

There are now many skilled artisans in the village due to the high immigrant population. These include four Nuni masons, four Nuni and two Mossi mechanics and five Mossi blacksmiths amongst others.

The village has received various infrastructure investments from a range of agencies. World Relief have provided a school that was built in 1988 with three classrooms; two grinding mills, one in 1983 and one in 1993, (the earlier grinding mill no longer works); a cereal bank installed in 1980 that no longer operates because of poor management; two wells in 1977 that dry up in the dry season, and a literacy centre (*centre d'alphabetisation*) in 1991. In 1991, ADESSI began working with the villagers in an agroforestry project, installing a well

and providing fencing and materials. In 1993, this was redesigned with the villagers into a dry season gardening and agroforestry project and the well was deepened.

5.2.5 Changing times

The Nuni of Lon can remember the Djerma invasions which still remain in the elders' memories from their parents. In their lifetimes, they can remember a meningitis epidemic which killed many people about 20 to 30 years ago. They also say that conditions started to change 20 to 30 years ago with the arrival of the immigrants (there is some disagreements as to whether the Fulani or the Mossi were the first to arrive) from the north. Before this, the Nuni remember fertile soils and streams always full of water, in addition to an abundance of wildlife, including elephants. One elder said,

> "*The immigrants have brought change, they cut the forest and make the soil poor, there is no longer bush meat as before, we have water problems because streams dry up, wild fruits are also becoming less. But they have brought modern farming techniques and they are merchants*".

However, the original inhabitants feel that they cannot comment on the immigrants because they are all Burkinabé. They say the immigrants have changed the life of the local people and there are now more things available in the village because of the larger population. Some people are worried that the reasons why the immigrants left their homes will one day come to pass with them and they are worried about land shortages. However, they say that with the spirit of co-operation they will try and make a successful future.

Animism was superseded by Islam as the main religion around 1970. The people say they feel freer under Islam and thus they say they can 'do what they want' and they are more 'civilised'. They have dropped all traditional collective Animist ceremonies. In the village, there are disused ceremonial sites containing idols where ceremonies were held to protect the forest and to worship the bush. Animals were sacrificed on holy rocks and near trees to resolve problems and to protect the forest from evil. Now these are no longer communally held and the custom of holding a ceremony after the harvest to thank the **Tia** has disappeared.

5.2.6 Village conflicts

There have been conflicts around issues of land, water and farms in the recent past. The first issue of land became an area of conflict in 1987 when there was a conflict over the delimitation of boundaries between Lon and Bonapio. The villagers were unable to resolve the issue between themselves and the administrative authorities had to step in. In 1990, after a series of dry years, water availability became a serious problem with many wells drying up well before the start of the rainy season and some Fulani women even camped overnight at the well in the hope of the well filling up in the night so they could draw water in the morning. The conflict arose when people from other cantons were coming and drawing water from wells in addition to people who drew water from wells they themselves had not participated in digging. The conflict was resolved through village discussions where it was decided that should villagers wish to draw water from wells they should help in digging them; they should also dig wells in their own canton, thus not endangering other people's supply. The conflict on farms is one of straying animals. Every year there are animals that stray onto farmers fields and damage some crops. Damage is repaid by the offending person who owns the animal. If it is not possible to resolve these problems in the village, they are taken to the Prefect at Cassou.

5.2.7 Seasonal migration

Every year, after the harvest, a number of young men migrate in search of paid labour. Destinations vary according to tribe; the Mossi tend to travel to Côte D'Ivoire to work on coffee or cocoa plantations or they may have relations there (in 1985 Burkinabé made up 18 percent of the male population between 15 - 54 years old in Côte D'Ivoire). The Nuni are more likely to travel to Ghana in search of work, due to their proximity to the Ghanaian frontier. Sometimes it is more common to find Burkinabé who speak some English than it is to find those that speak French in villages close to the Ghanaian border. Other common destinations are the big towns in Burkina Faso such as Koudougou, Ouagadougou and Bobo-Dioulasso. Most people go in search of paid labour, to buy things such as radios, bicycles or mobilettes, but some go simply to travel. Often on returning to the village of origin, the migrant is frequently suffering from illness, perhaps because of the stress of being away, foreign food and climate and exposure to different strains of

illness. This increases the hardship of the person's family because it is often them that must pay the medical bills and take care of the sick person, which further stresses the household.

There is a feeling in Nuni villages that the village should be the central point of life for its members. The village should be invested in and 'developed'. Migration is sometimes frowned upon because it depletes the resources of the village, alternately, in-migration (the Mossi) is in this sense accepted because it is felt that the influx of people, knowledge and resources leads to the 'development' of the village. A frequent topic of many of the famous Burkinabé films (e.g. Tilai and Yaaba by Idrissa Ouedraogo) are stories of youths who leave their village of origin to go to the big cities of Accra or Abidjan in search of their fortune, only to return either HIV+ or culturally alienated from their families. In Burkina Faso, the integrity of the village is central to Burkinabé culture.

Migration in Lon is more readily accepted and understood than in the other two villages: it appears to be a traditional way in which to generate income for the family off-season. This may be due to Lon's relative resource shortages, whereas in Boutiourou and Saboué the resource base provides more off-season earning opportunities.

5.2.8 Networks and linkages of the Nuni

Networks and linkages between communities tell us something about the security of the villages, their production systems and their kinship networks. These networks, which can be defined as a group of spatially dispersed communities or individuals which are connected in some way, form part of the broader risk-minimisation strategies employed by the village communities. Most of the linkages, which for the networks, are a result of either parentage, i.e. a resident's parent lives in another village which accords bonds between the parent's village and the resident's village, or, as a result of marriage, where a 'child of the village' (usually a girl) is taken as a bride in another village. These linkages have long been recognised as an important aspect of rural communities survival strategies. Adams, (1993) notes that "exogamous marriage alliances facilitate a risk-spreading diversification of social and economic networks beyond the village". Another important link is that of a member of a village (usually a boy or man, but it can also be a girl or woman) working in another village or country. Additional linkages are administrative linkages, i.e. the connection between the

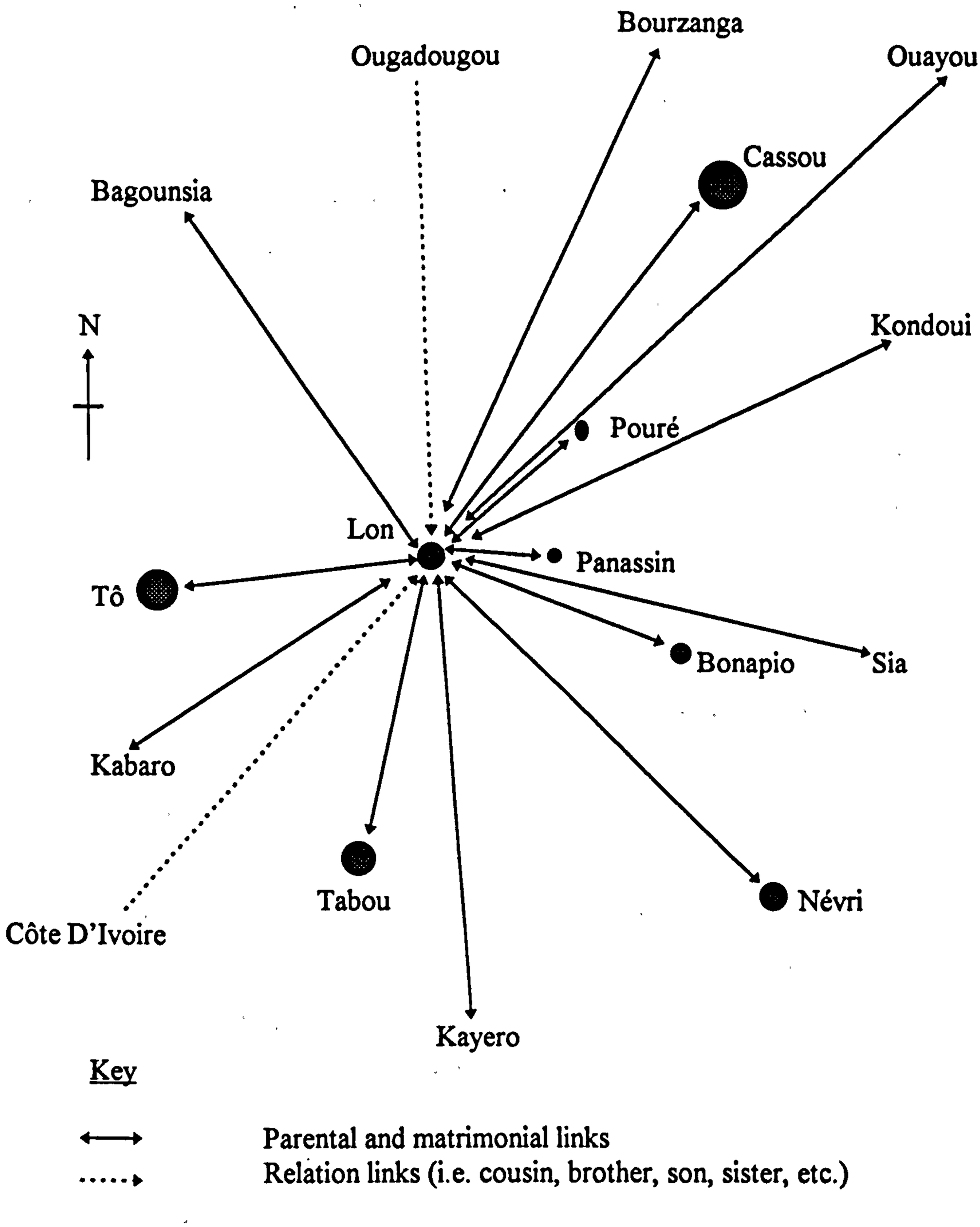
village and its departmental capital, and in the case of Lon skill sharing linkages, where one village exchanges skilled labour with another.

The nature and extent of these linkages differ (if only slightly, as in the case of Lon and Boutiourou) according to the different villages. The differences between the networks are caused by two main factors: the age of the village and the number of founding families.

Lon has 13 linkages due to either parentage or marriage and an additional two linkages because of relations working in either Ouagadougou or in Côte D'Ivoire. Not only are relations seasonally migrating to the latter two areas but original members of the village have settled there to become the heads of family and some have not returned for twenty years. The links of such situations, however, remain strong with those who have permanently settled in other areas acting as hosts for young men who seasonally migrate to find work.

Lon was formed by two families, the Napon and the Benao, and it is from these that the original links were formed, with their parents (from Nevri) and from the marriage of their daughters in other villages or the migration of their sons. As additional Nuni families arrived they then formed their own networks, thus increasing the overall linkage structure.

Figure 5.3 Networks and linkages of the Nuni in Lon, 1995[5,6,7]



Source: Author's fieldwork, 1994.

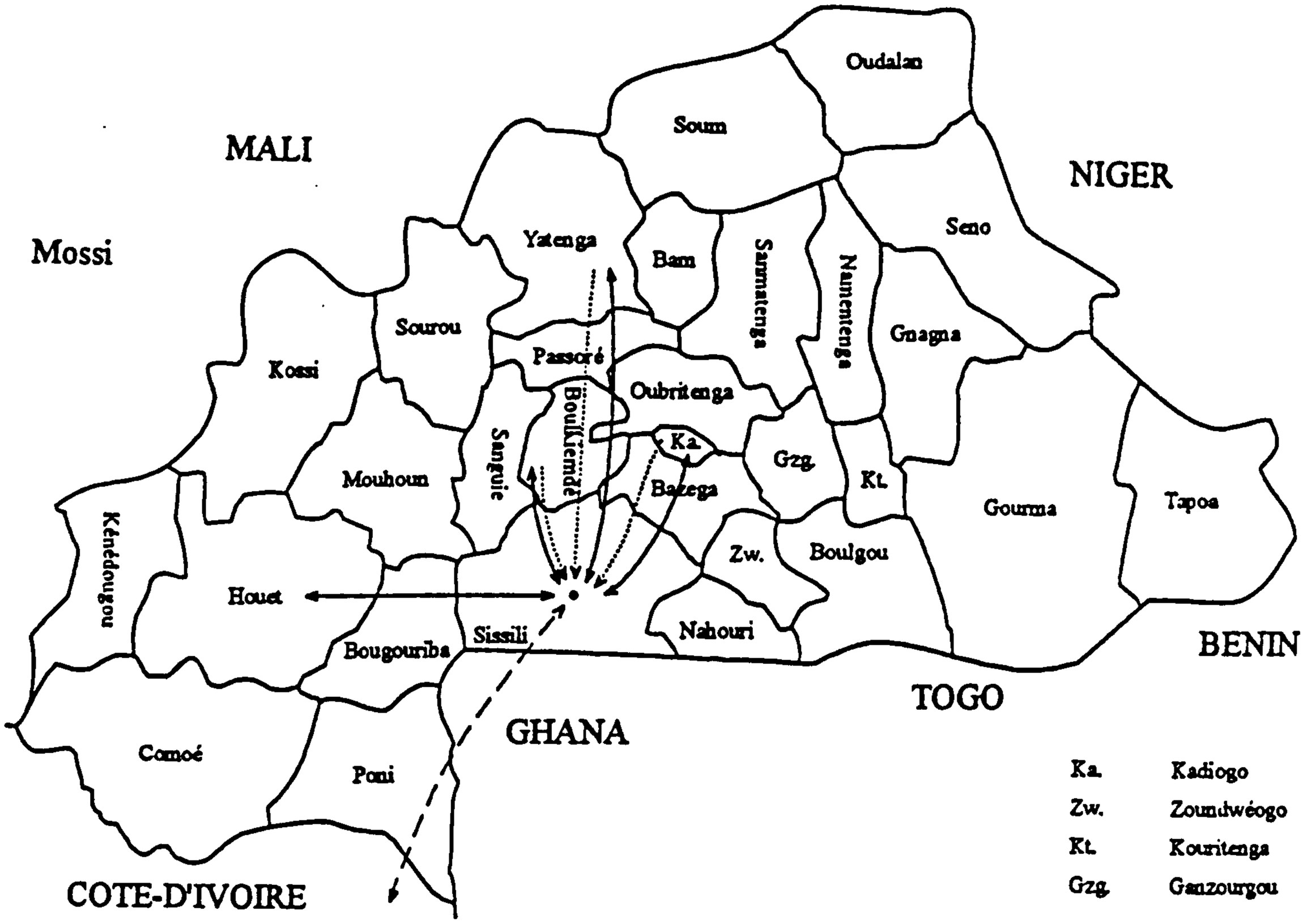
[5] The links with Cassou has additional administrative links with Lon, being the departmental capital, and Bonapio, which also has additional links through skill sharing artisans.
[6] The information for this map was obtained through interviews with village elders.
[7] The size of the circles are proportional to the size of the villages and the village names with no circles indicates that they are situated off the diagram.

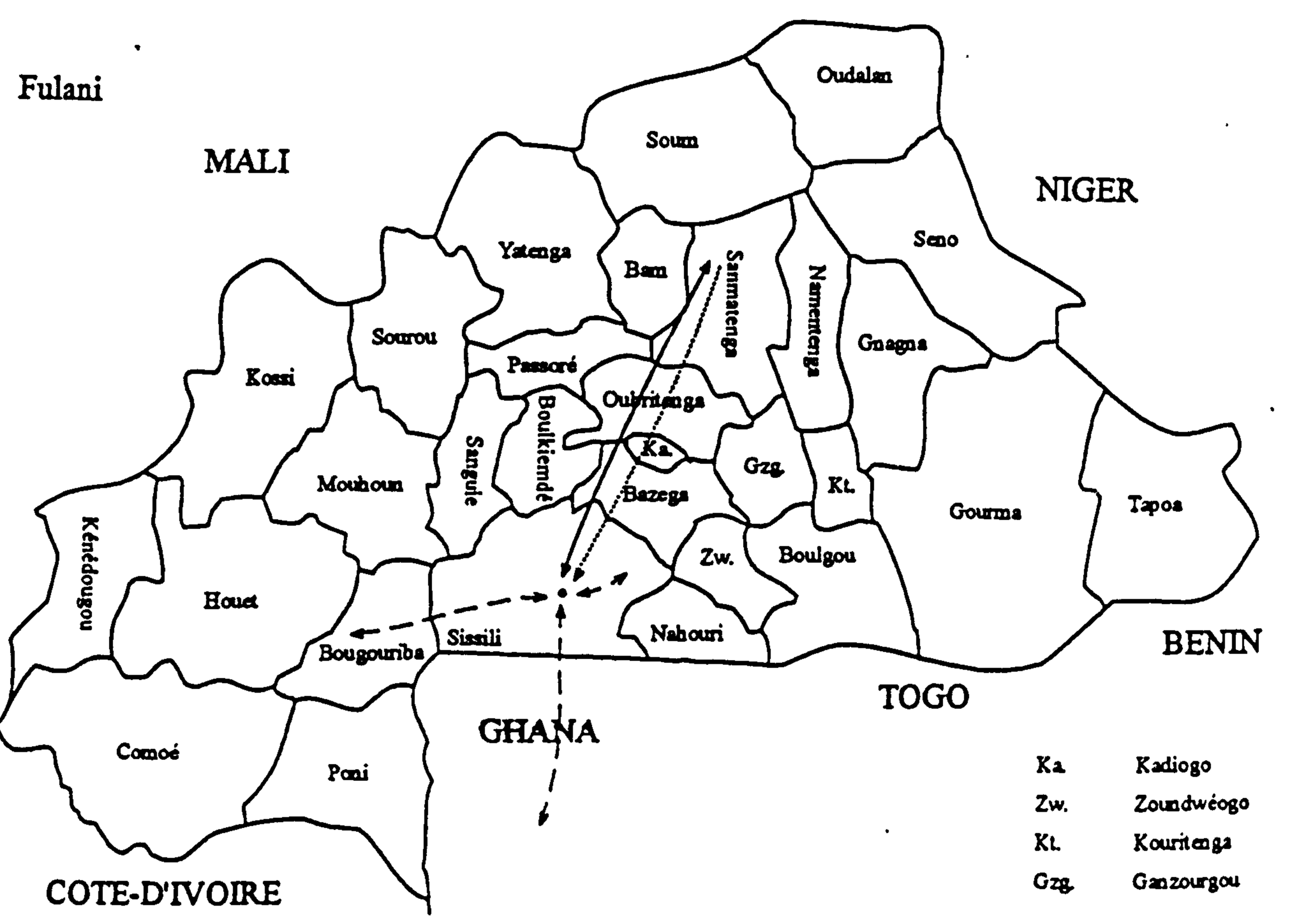
5.2.9 Networks and linkages of the immigrants

The Mossi of Lon come from three provinces: Yatenga, Kadiogo and Boulkiemdé (see figure 5.4). This is echoed in the three Mossi settlements in Lon; the Mossi from Koudougou (Boulkiemdé), the Mossi from Ouagadougou (Kadiogo) and the Mossi of Badakui (from Yatenga). These separate lineages have their own links of reciprocity in these respective areas, which are more heavily weighted in the south - north direction (i.e. remittances more strongly expected from those Mossi living in Sissili than *vice versa*). Remittances, as with all the Mossi in the villages, are more likely to take the form of visitors, marriage partners or for schooling than monetary or food donations. For example, a Mossi in Lon (or Boutiourou or Saboué) may take younger relations from their places of origin to stay with the family for anything from a couple of months to a few years, likewise a Mossi from Sissili may send one of his children to a Koranic school in the north. There may be gifts associated with the occasional north-south, south-north visits, but in general these remittances do not provide major sources of food or cash income for either group. Moreover, they will provide 'bonuses' for the remaining northern family, for example a Mossi from Lon (or Boutiourou or Saboué) may, after a good yam harvest, put a portion of that harvest on one of the 'transporters' that service the Sunday market in Léo, to take back to their families.

The Mossi of Lon also have family links in the Côte D'Ivoire and in the province of Houet. The link with the former is by far the most important as it provides a place to stay and an initial point of contact for young males seasonally migrating from Lon to find paid employment. It is common to have quite significant remittances from both the relation living in Côte D'Ivoire (on the arrival of the village inhabitant after the period of migration) in the form of gifts (e.g. a cassette recorder, radio, or food) and, more importantly, the returned seasonal migrant who is duty bound to return with at least some gifts for his family.

Figure 5.4 The origins and linkages of the Mossi and Fulani in Lon.





Key.
- ····→ Origins.
- ←— — —→ Relation links (i.e. brother, cousin, son etc).
- ←——→ Marital links.

These diagrams are based on interviews with Fulani and Mossi in the fieldwork 1993-1995.

The Fulani in Lon came from the province of Sanmatenga and have few linkages compared with the other immigrants. These Fulani came in their clan groups and are currently content to stay in the southern zone of Burkina Faso. They have links with family relations living in Ghana which are related to trade (cattle gain a higher price in either Ghana or Côte D'Ivoire). 'Living' is a fluid term when it concerns nomads and is more likely to mean that they constantly have some family members in Ghana, but these members are interchangeable with those in Lon. As a large part of their transhumance entails routes through Ghana, family members in place are a necessity. They also have links with other clan members in Bougouriba and another village in Sissili relatively close by. This 'close spreading' is also seen with the Fulani of Boutiourou and is related to herding. Some members of the family will go and 'live' in one area for an unlimited amount of time with their herd, or part of it, while the pasture and water remains good. It will also consist of one Fulani clan giving one of its daughters to another clan for marriage. The Fulani's risk minimisation network is different from the Mossi or the Nuni because of the Fulani's mobility and very wide and distributed clan network. Clan relations stretch back for many generations and are made up of many splits, all of which maybe available to call on in times of need.

5.3 Legal arrangements and administrative decision making

The legal arrangements in Lon and by far the most complex of the three villages. It has the longest history of immigration, the highest population and the poorest quality of resources in relation to the two other villages. It also has somewhat confused legal and administrative structures that are a result of the villages history and the breaking off by the Benao family to form the settlement of Lon and the original Napon family staying in Badakui (the totality is known as Lon).

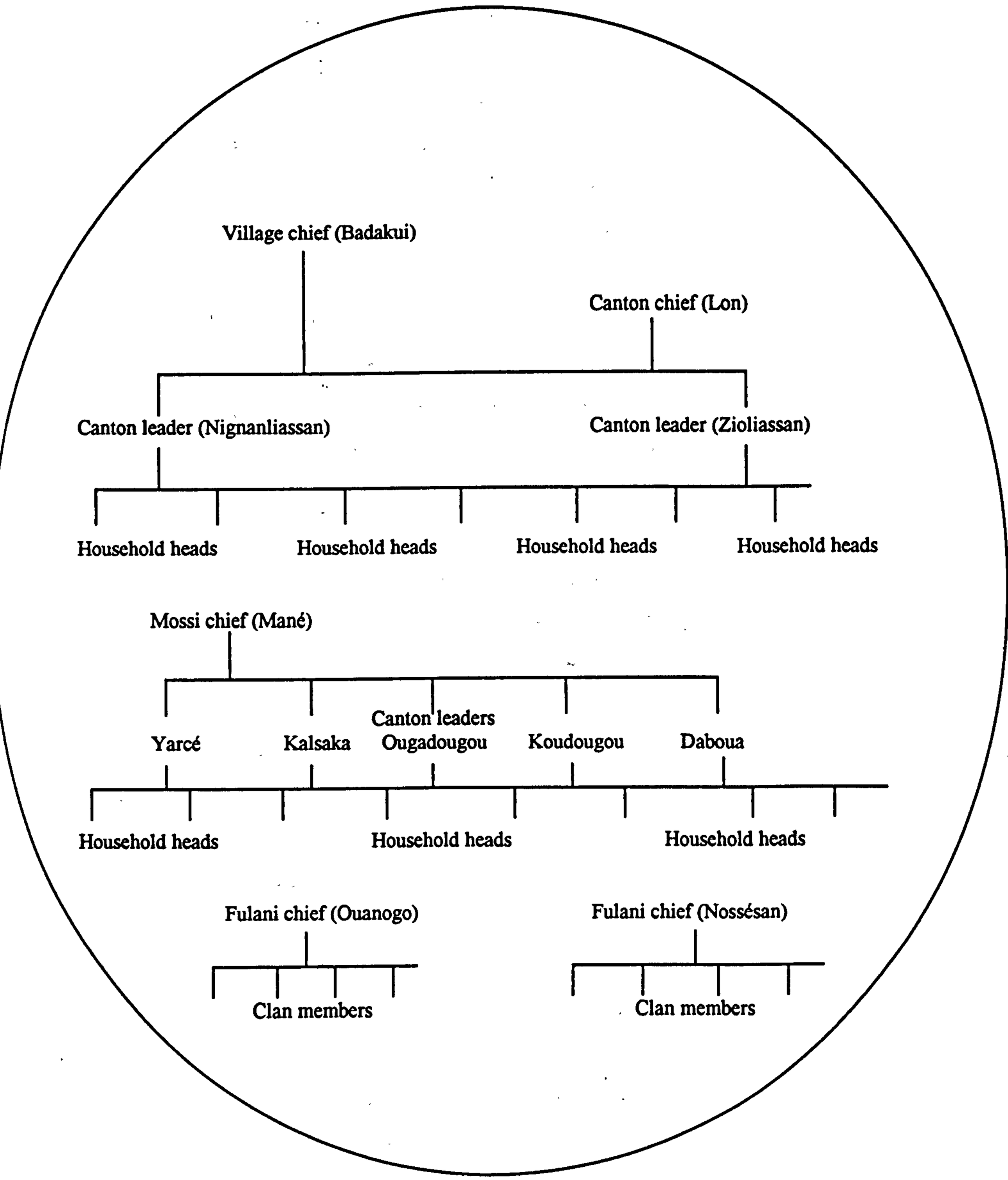
This tangled history warrants some explanation. If we go back to look at the oral history of Lon we see a split in the settlement of the original families. The Benao family, because they were the second family to arrive are under the jurisdiction of the Napon family in Badakui. This is because of the latter's historical gifts of his cattle herds and a wife. History provides strong legal loyalties and are used as foundations for contemporary traditional legal arrangements. History is used as a source of undisputed facts and has its origins in Animism

and the connection that the divinities gave their blessing to the original settler as the custodian of the land. Thus, the Napon family will always have legal superiority over the Benao family who will afford the former the respect they deserve. Below is a description of how traditional Nuni legal and administrative arrangements are structured.

In figure 5.5, the village chief (there is no land chief because as the first and only settler he was accorded powers over both the people and the land of the area) of Badakui is on a superior level to the canton chief of Lon. This means that decisions over serious matters will be decided upon by the village chief. However, the Benao family have relative autonomy to make their own decisions over what takes place in their 'half' of the territory. Likewise the village chief makes decisions concerning his part of the territory. These 'halves' can roughly be seen on the map as: the Benao area of jurisdiction being from the built up area of Lon north running along the road to Cassou and everything east of there and also a small section south of the habitation of Lon below the road to Tô. The head of the Benao family will make decisions regarding these areas with the elders of his canton and Zioliasan. The village chief has control over the remaining territory and he will make decisions with the Nuni elders of Badakui and Nignanliasan. It should be noted that trust exists between the two families in relation to the good custodianship of the land. However, when misdemeanours occur the village chief will intervene and question decisions.

In the preceding paragraph, traditional Nuni law was discussed. However, due to the level of immigration and the immigrants integration into Nuni society the traditional legal and administrative arrangements have begun to change. On figure 5.5, unlike the other village diagrams there is no confining land area for the immigrants (i.e. no circles around the respective immigrant power structures). The immigrants in Lon were never given a definite territory, as in the case of Boutiourou, that they were restricted to, they were only given vaguely defined areas where they could farm, e.g. the first Mossi settled around Badakui and became the Mossi of Badakui and were allowed to farm around Badakui. It would not have been possible for these Mossi to farm in the far north for example because this would have been out of their area of jurisdiction.

Figure 5.5 A diagrammatic representation of the power structures in Lon



Source: Author's fieldwork, 1993-1995.

Because of the prolonged time period that the immigrants have been in Lon, they have significant relationships with many Nuni and *vice versa*. They have also been allowed to set up their farms in close proximity to Nuni farms and are now their neighbours. The Nuni and Mossi celebrate religious festivals together, births, deaths, prayers and have become extremely well assimilated into the broader society. It follows that this closeness has brought about some sharing of decision making or at least allowed for heavy consultation with Mossi and Nuni alike (and occasionally Fulani). Similar relationships and situations can be found in the anthropological literature. For example, Platteau (1991:122) illustrates that "access to land and other vital resources is not necessarily predicted upon kinship or descent-based ties, but may also be grounded upon loyalty and patronage relations which are often associated with ascriptive forms of status or social identity[8]". Thus, the landscape of Lon has developed into a shared landscape rather than a tripartite one as in the other villages. It is in the interest of all tribes to safeguard the productivity of the land and so presently much of the decision making about the function of the land, conservation measures, experimentation with new farming techniques, etc., as well as occasionally discussions about land distribution, are taken as an inter-tribal group of elders. The Mossi also regulate their own affairs, communicating with their relations in the north of Burkina Faso that there is no more land left to farm and as a result immigration has stopped.

The Fulani also play their role. They have been allowed to settle in the more wooded areas of Lon's territory and, as in Boutiourou, play a protective role, safeguarding the bush for future farming and gathering products. As no farmers will farm next to them, the Nuni chiefs have effectively protected the southern and eastern (sacred forest reserve) areas for the future.

The Mossi have their own power structures with the original Mossi settler acting as the chief to all Mossi in the territory. Although most Mossi disputes are regulated in the respective groups, in the event of a serious problem, the Mossi chief has the final decision. The Fulani regulate their own affairs within their respective clans and do not have a common Fulani chief.

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[8] However, Platteau (1991:122) also says that 'insiders' enjoy more rights and benefits than the stratum of 'outsiders'. This can be seen in all the villages with the Nuni having secured access to the better soils and the upholding of the Nuni traditional rule of law ensures this.

It is a natural progression that in a territory characterised by a high population of a relatively integrated nature that have been in that area for a long duration with no major conflicts, that legal and administrative control take on a more consultative and wider ranging nature. Even if the final decision rests with the Nuni there will be a collaborative decision making process which is necessary in an area where questions of resource use and distribution are paramount.

5.4 The Nuni of Lon

5.4.1 The Nuni production system

The average Nuni family[9] in Lon is made up of a husband and his two wives. They have on average nine children; five boys and four girls. It is unusual, however, to find only one family of this nature living under one roof (although it is seen in 'young' families who have recently moved out of the paternal home). More commonly, there are a number of family units (i.e. one husband, one or two wives and children) living together who share a common parent. For example, the head of the household may be an eldest brother who is living with his two brothers, all of which have from one to three wives and numerous children. Alternately the head of the household will be sharing the compound with his grown up male children who also have their own wives and children. The latter situation may develop into the head of the household 'retiring' because of age or ill-health and his sons taking over the farming activities completely, albeit under his supervision. The mother of the head of the household is also often present as the household 'manager' or chief adviser. A household therefore can contain anything from seven people for a 'young' family recently moved house to 30 people for an old, established family. The average Nuni household unit in Lon has a total of 21 individuals and is composed of, on average three men (the family head and his brothers or sons), five women (the wives of the men) and 13 children. Each household has suffered four child deaths of two boys and two girls.

The Nuni bush farms are situated in the southeast, the west and to the east. They are on average 3.75 hectares and are 1.75 km from the compound. The Nuni have freedom of

[9] This, and the family data in all the villages, is based on information from the household questionnaire.

choice where they want to farm, which tends to be on old fallows although virgin land is sometimes available. The most common soils which they cultivate are sandy argillic, of medium to low fertility. They farm the same piece of land for three to six years, leaving it fallow for between three to six years before cultivating the same piece again. When the Nuni prepare fields for cultivation they selectively fell the trees leaving fruit and food trees. They say that they have changed their farming techniques in the last seven years and now the sow in line, use ploughs and chemicals for seed treatment.

The Nuni women also farm, concentrating on growing sauce ingredients and cereals for making To. Women also usually take care of the household fields which are adjacent to the compound and do not normally exceed 0.25 hectares. Women cultivate on average 0.75 hectares and it is their husbands who give them permission to farm. The fields exhibit village field characteristics, i.e. they have important dietary roles and relatively high value crops which require relatively high input of labour, but they vary in their distance from the compound from adjacent to the houses to up to 2.5 kilometres away. The soils on the women's fields are of low to medium potential and are usually **tekassoulou** soils. Some women say they receive virgin bush to cultivate but others do not and a small percentage of the group fallow their land after three to five years of cultivation. The women say that they started the 'modern' way of farming, with line sowing, using chemical inputs and draught animals in 1990.

The Nuni say that in the past farming was solely for subsistence and the field sizes and harvests were smaller but it was also more labour intensive. Presently however, field sizes have increased and draught power and chemical inputs are used on farm.

Table 5.4 A typical Nuni agricultural calendar in Lon

Month	Activity
January	Clearing of cotton stalks , branches and bushes from the fields.
February - March	No farming activities.
April	Clearing the fields of leaves and branches, if rains come early, sowing of white sorghum, early groundnuts and yam.
May	Sowing millet, maize, white and red sorghum, groundnut, yam, beans, cotton.
June	Sow cotton, maize, yam, millet, cowpeas, bambara nuts, crop upkeep.
July	Sow maize, bambara nuts, cowpeas, sweet potato, crop upkeep and cotton treatment.
August	Sow groundnut, cowpeas, sesame, sweet potato, *buttage*, harvest of early groundnuts and first yams.
September	Harvest maize, groundnut, beans, red sorghum, bambara nuts, preparation of next years yam fields.
October	Harvest white and red sorghum, groundnut, sweet potato, cowpeas, bambara nuts, prepare next season's yam fields.
November	Harvest millet, cotton, yam, sweet potato, white sorghum.
December	Harvest cotton, yam, sweet potato.

Source: Author's fieldwork, 1993-199

5.4.2 Animal husbandry

Although there are a number of animals kept by the Nuni compounds of Lon, there is an unequal distribution of number and species. Most Nuni keep fowl which serve the purpose of gifts, providing eggs (for consumption or sale) and as small savings accounts (they can be sold when pocket money is needed). The average Nuni household will have approximately 20 chickens and 10 guinea fowl. Sheep and goats are reasonably well distributed throughout the Nuni households, with about two-thirds of all Nuni each having on average seven sheep and five goats. These are sold when emergencies arise or for festival feasting. One third of Nuni households own cattle, which are used for ploughing and also may be hired out for the same purpose. Usually a single cow is owned. One third of Nuni households also own a donkey, which, if female, is usually with foal, which is either kept or sold. These are used for pulling a cart and for draught power. Some examples of animal use are seen below:

Table 5.5 Examples of the revenue and purpose of Nuni animal sales in Lon, 1994

Example one		**Example two**	
I sold 21 guinea fowl at 600 FCFA each	12,500	I sold 20 chickens at 700 FCFA each	14,000
I killed 4 goats and 1 sheep for my fathers funeral		I sold 15 guinea fowl at 600 FCFA each	9,000
		I sold 4 goats at 5,000 FCFA each	20,000
		I sold 4 sheep at 7,000 FCFA each	28,000
Total	**12,500 FCFA**	**Total**	**71,000 FCFA**

Source: Author's fieldwork, 1994-1995.

In the dry season the animals are left to wander more or less where they want in the vicinity of the Nuni compounds. In the rainy season they are tethered so as not to damage the crops. Forage (mostly millet stalks) is collected at the end of the rainy season and stored (usually stacked up on the roofs of hangars) for the dry season. The chickens and fowl are reared in the fields in the rainy season (often the Nuni men will 'live' in the huts they have built in the fields for most of the rainy season which enables them to constantly supervise their crops, and protect them from vermin). Here the fowl can be fed on termites and any loose grain that is available. They are kept in and around the compounds in the dry season.

In the past women were generally forbidden to keep animals. But, like the other villages, they are beginning to keep animals, principally fowl which are kept around the house and are sold to buy sauce ingredients in times of need.

5.4.3 Household consumption

After the harvest the cereals are stocked in the granaries. Some people use chemical treatment, some mix the cereals with ash and some use no treatment. Cowpeas and bambara nuts are generally stored in the granaries mixed with ash to protect against weevil attack. Groundnuts are stored in sacks in the house. For the majority of the time, the harvest suffices the Nuni family for the whole year. In times of deficiency, animals are usually sold to purchase extra grain. The consumption of meat varies greatly amongst the Nuni families from once every three days for some families to once every three weeks. Most families, however, will eat meat once a week or once a fortnight. In the past wild meat played a significant part in food security. This, however, is no longer the case.

Table 5.6 Typical Nuni consumption rates in Lon for a range of crops, in percentage values of total produced

	Maize	Millet	Sorghum	Yam	Sweet Potato	Groundnut	Cowpeas	Beans	Cotton
Eaten	100	100	100	50	10	10	80	90	0
Sold	0	0	0	45	90	80	15	0	100
Seed	0	0	0	5	0	10	5	10	0

Source: Author's fieldwork, 1993-1995.

The consumption rates shown in the above table are typical of a Nuni household; they consume most of their staple cereals, cowpeas and beans and sell much of their tubers and cotton. The reason why a relatively high proportion of yam are consumed in this case is because cotton cultivation has replaced yam to some extent as the main cash crop, allowing half of the yam crop to be eaten. Cereal seeds are bought at the beginning of the season but a proportion of the bean, groundnut and cowpea harvest are reserved for seeds for the next season. Some yam tubers are kept for planting stock for the next season and sweet potatoes are propagated from runners.

Below is a typical Nuni food calendar in Lon. It should be noted that wild, gathered foods play an important role in household diet and nutrition, especially in the period before the harvest.

Table 5.7 A typical Nuni food calendar in Lon

Month	**Diet**
January - February	White sorghum To, rarely cowpeas, dry sauce of okra, sorrel, niébé and *kapokiér* leaves, flour of baobab leaves, fruits of detarium (*D.microcarpa*) and **kantouagna**.
March - April	Millet To, cowpeas or bambara nuts, dry sauce of okra, sorrel, niébé, *kapokiér*, **kagnanou** and **poa** leaves, flour of baobab leaves, fruits of detarium and néré.
May - June	Red sorghum or millet To, rarely cowpeas or bambara nuts, sauce of sorrel, leaves of niébé, fresh okra, fruits of liana, wild grape and karité.
August	White or red sorghum To, sometimes fresh maize, yam, fresh sauce of okra, sorrel, niébé, groundnuts.
September - October	Maize To, yam, sweet potato, groundnuts, fresh sauce of okra, sorrel, niébé, groundnuts.
November - December	White sorghum To, cowpeas, bambara nuts, yam, sweet potato, dry sauce of okra, *kapokiér*, sorrel and fresh niébé.

Source: Author's fieldwork, 1994-1995.

A variety of foods are gathered from the forest including **ganka** (*Diospyros mespiliformis*), tamarin, *kapokiér*, néré, detarium, liana, wild grapes, karité, **kagnanou, poa, kolou, sao,** and **tounapou**. All the things gathered from the bush can be found in the village territory up to distances of seven kilometres, the Nuni do not have to leave their own territory.

5.4.4 Household income and expenditure

Lon is at the cross-roads of three big markets; the markets of Cassou to the north, Tabou to the south and Tô to the east. Most people from Lon, if they have anything of high value to sell will take it to Tô. Tô has a large market every Thursday and it specialises in the sale of animals. People also sell their goods in Lon which has a weekly market in the village.

Approximately half the Nuni hire labour at some point in the agricultural season. For example, one Nuni farmer hired a Nuni youth group of 17 members for 2,000 FCFA per day to clear his field. Another farmer hired four Nuni men for 900 FCFA per person per day for the same work. Although most Nuni hire Nuni, Mossi labour is also used; one Nuni farmer hired two Mossi men for 4,000 FCFA for six days labour.

The Nuni women also hire labour for agricultural work and they also hire animals to plough their fields. For example in one season, a Nuni woman hired cattle and plough at 2,000 FCFA to plough one field, the same woman also paid one Nuni man 1,500 FCFA for two days work preparing her field.

Most Nuni men take advantage of credit (Nuni women do not), which is usually from SOFITEX, the national cotton co-operative, as the majority of Nuni farmers grow cotton. SOFITEX provide the farmer with cotton fertiliser and cotton insecticide at the beginning of the season on credit and expect repayment at the end of a season. For example: an average farmer who grows cotton will use two 50 kg bags of NPK and two 50 kg bags of Urea, this would cost them 6,000 FCFA which is payable at the end of the season. One Nuni farmer took one sack (50 kg) of NPK and one sack (50 kg) of urea from SOFITEX at 5,500 FCFA for each sack. He also took six litres of insecticide at 1,500 FCFA per litre, the total credit coming to 18,000 FCFA repayable at the end of the season. Another person took one sack (50 kg) of

NPK (nitrogen, phosphorus and potassium fertiliser) and one sack (50 kg) of urea from SOFITEX at 5,500 FCFA for each sack. He again took nine litres of insecticide at 1,500 FCFA per litre and one sack of cotton seed for 400 FCFA, with everything totalling 24,900 FCFA. Another example is a farmer who took credit to purchase a cart and plough which has repayments of 25,000 FCFA per year for five years.

The average Nuni household spends approximately 10,000 FCFA on cotton fertiliser (NPK and urea), 12,000 FCFA on cotton insecticide and 750 FCFA on cotton seed treatment (Calthin) all of which are usually purchased from SOFITEX. Some Nuni buy non-cotton fertiliser for their maize fields, which can range from one 50 kg bag of NPK to three 50 kg bags, and costing anything from 4,000 FCFA to 15,000 FCFA.

At the market, the Nuni men sell groundnuts, some cereals, animals, sweet potato, yam, cowpeas and cotton is sold to SOFITEX who come to collect the cotton harvest at the end of the season. The Nuni women sell groundnuts, chickens, sauce ingredients, karité butter, karité soap, cakes and **soumbala**. Women generally sell most of their products from home and only take any excess to the market which saves time that they can spend on other activities. It is also advantageous to customers because many prefer to buy small amounts rather than spending large weekly sums at the market (Schrekenberg, 1996). If women have any excess it is sold at the Lon market and, if they have anything special, such as animals, for sale, they may take it to the market at Tô.

The Nuni conserve all of the cereals for consumption unless, like in the other villages, they are certain that there is sufficient to supply the family's dietary needs and have a surplus. If there is a surplus it will be sold in July and August for money for agricultural inputs such as fertiliser. Fresh groundnuts will be sold in August or September, directly after the harvest, and dried groundnuts will be sold in January to March. Cowpeas will be sold in November and December after the harvest and cotton is sold in January or February.

The Nuni men spend money on a range of things, including, clothes, medicine, agricultural tools, on the repayment of credit, on dowries, funerals, marriages, school fees and bicycle repairs. The biggest expenditure is on clothes, credit repayment and school fees. Nuni

women spend on clothes, pots and pans, sauce ingredients, salt, spices, beauty products. The spend most of their money on clothes and sauce ingredients.

5.4.5 Women's timetables.

Women in Nuni communities play a vital role in diversifying household activities and sources of income. Some commentators have said that the women's economy is a separate economy which is true to the extent that activities are clearly differentiated between sex. However, all activities, carried out by men or women, are aimed at increasing the household's resilience and prosperity.

In the following tables there are timetables that outline Nuni women's daily and yearly activities.

Table 5.8 A Nuni woman's typical daily timetable in Lon

Time	Activity
5 - 7 am	Heat water for washing, sweep the floors,
7 - 8 am	prepare breakfast,
8 - 9 am	wash the children, fetch water,
9 - 11 am	pound millet, wash the pots,
11 - 12 p.m.	prepare midday meal,
12 - 2 p.m.	individual activities,
2 - 3 p.m.	grind flour at the grinding mill,
3 - 4 p.m.	fetch water for the evening,
4 - 5 p.m.	heat water for washing and wash the pots,
5 - 6 p.m.	prepare evening meal,
6 - 8 p.m.	eat and tidy up,
8 -	rest and sleep.

Source: Author's fieldwork, 1994-1995.

From the above table it is clear how full the women's day is. All the activities carried out by women ensure the functionality of the household. Any further activities carried out act as bonuses to household survival. Below is a Nuni woman's yearly timetable.

Table 5.9 A Nuni wɔman's typical yearly timetable in Lon

Month	Activity
January - February	Selling karité butter and soap, **soumbala**, cakes, groundnuts, trade in cola nuts, harvest *kapokiér*.
March - April	Selling karité butter and soap, **soumbala**, néré flour, cakes, groundnuts, trade in cola nuts, harvest *kapokiér*, néré, detarium.
May - August	Making and selling karité butter and nuts, farm work.
September - October	Harvest and drying sauce ingredients.
November - December	Selling karité butter and soap, **soumbala**, cakes, groundnuts, trade in cola nuts, harvest *kapokiér*.

Source: Author's fieldwork, 1994-1995.

Again the above table illustrates the range of activities that women are involved in. It is clear that women are involved in trading and selling for most of the year and can be at a market as much as three days a week. Women also help the men at harvest time.

5.4.6 Reaction to the immigrants

The Nuni have allowed the Mossi, and, the Fulani, to integrate fully into their society. There is a positive attitude to the skills and resources that the immigrants have brought and this is thought to contribute to the village's development. However, the Nuni are worried that the resources in Lon are beginning to become scarce. This they say is the fault of the immigrants.

5.5 The Mossi of Lon

5.5.1 First arrivals

"On est venu ici en fortune, si non, on avait à manger chez nous mais on a quitté dans l'intention d'avoir plus[10]*"*.

[10] "We came here seeking our fortune, although we had something to eat in our homes, we came here with the intention of having more".

The first Mossi of Lon came in 1969, with other groups arriving in 1978 and 1981 and the last significant Mossi immigrants came in 1985. Some people came seeking their fortune but the majority came because they were pushed out of their homelands by droughts and poor rains. Most of them arrived by truck that deposited them at Tô. The Mossi of Lon have the majority of their families and relations in the Mossi Plateau in the provinces of Yatenga, Kadiogo and Boulkiemdé. They also have family relations in Côte D'Ivoire, Bobo-Dioulasso, Pitinga, Gnessou and Ouagadougou.

5.5.2 The Mossi farming system

The average Mossi family in Lon consists of a man with two wives and seven children; four boys and three girls. The Mossi household in Lon contains the highest number of people out of the three case study villages because the immigrants have been here the longest. The average household unit consists of 13 people, three men, three women and seven children. The head of household has a lower than average number of wives with one man having on average only one or two wives. The number of children is also low. Thus, although the household is highly populated the size of the conjugal units are small. Like the Nuni, each household has also lost on average four children, two boys and two girls.

Due to the long stay, the Mossi have effectively assimilated into Nuni culture and, to a certain extent, *vice versa*. The Mossi have married Nuni women and Nuni men have married Mossi women and there are mixed working groups, both men and women. More so than the other case study villages, the language of communication is predominantly Mooré. In addition to this, the Mossi live inter-mingled and side by side with the Nuni and as such their fields are also often inter mingled. Because of all these factors there are often Mossi fields in the Nuni areas as a result of the Nuni giving their fallows to their Mossi friends.

The Mossi cultivate on average approximately four hectares with an additional 0.5 to one hectare as a village field and between 0.25 and 0.5 hectare as their household fields. The Mossi bush fields are on average two kilometres away from the compounds. The village chief allowed them to farm on these areas. The soils put under cultivation are **bissidagaré**

and **zinua** soils and these are farmed continuously for three to six years and then are left fallow for about three years when it is recultivated.

The Mossi women also have fields of on average 0.5 hectares. On these fields they grow cereals, groundnuts and sauce ingredients. Some of the women are given their fields by their husbands which tend to be the husband's young fallows. Other women have approached the Nuni chief individually and have received land from him (again these tend to be young fallows).The soil has medium to low fertility and some of the women leave the land fallow after cultivating the land for four years. Other women do not leave the land fallow. This depends on the proximity of the field to the compounds. The closer the field is to the compound the more easily inputs can be applied. One woman has cultivated the same 0.5 hectare field for 14 years.

Table 5.10 The Mossi's typical agricultural calendar in Lon

Month	**Activity**
January	Clearing of cotton stalks, tree branches and stumps.
February	No farm work.
March	Clearing of leaves and stalks from the field.
April	Field preparation, sow millet, white sorghum, cowpeas, and groundnut if there is rain.
May	Sow cotton, sesame, maize, millet, red sorghum, cowpeas, bambara nuts, groundnut.
June	Continuation of sowing and crop upkeep.
July	Sow sweet potato, bambara nuts, groundnut, cowpeas, weeding, hoeing, replanting and thinning.
August	Crop upkeep, harvest groundnuts.
September - October	Harvest maize, cowpeas, bambara nuts, groundnuts.
November - December	Harvest red and white sorghum, sesame, millet, sweet potato and cotton.

Source: Author's fieldwork, 1993-1995.

The Mossi say that many people are now farming like the Nuni, mainly having adopted their *buttage* technique. Others, however, do not use this technique because they say its too difficult. Another comment by the Mossi was that the Nuni have adopted some of the Mossi techniques, but the Mossi no longer cultivate in the same fashion that they did in their places of origin.

5.5.3 Animal husbandry

Not surprisingly the Mossi are more prolific animal keepers than their Nuni neighbours (because of their long history of animal rearing). Almost all families have sheep, goats and fowl, and a good percentage have at least one cow. Approximately half of all Mossi households owns one or two cattle; two thirds own goats and sheep ranging from anything from seven to twenty of either species; every household has chickens that number from between 10 to 100 and most have on average 20 guinea fowl. Donkeys also play an important role as beasts of burden. Although there were a significant number of donkeys in the village it was not possible to calculate ownership on a household basis because donkeys were often 'owned' by a number of people or shared and rented out. Table 5.11 gives examples of animal uses by Mossi households.

Table 5.11 Examples of the revenue and purpose of Mossi animal sales in Lon, 1994

Example one		**Example two**	
I sold:		I sold:	
10 goats for 3,500 FCFA each	35,000	2 goats♣ for 3,500 FCFA each	7,000
20 chickens for 750 FCFA each	15,000	1 sheep♦ for 5,000 FCFA	5,000
Total	**50,000**	16 guinea fowl for 750 FCFA each	12,000
		Total	**24,000**
Example three		**Example four**	
I sold:		I sold:	
20 chickens for 750 FCFA each	15,000	5 goats for 4,000 FCFA each	20,000
Total	**15,000**	20 chickens♥ for 700 FCFA each	14,000
		10 guinea fowl♠ for 650 FCFA each	6,500
		Total	**40,500**

♣for school fees ♥to resolve problems
♠for clothes and shoes ♦for clothes
Source: Author's fieldwork, 1994-1995.

Table 5.11 indicates that the Mossi have more diverse uses for animals and use them for a range of economic objectives than do the Nuni.

It is unusual for women to rear animals in Lon because it is still traditionally frowned upon and thus only a handful of households allow women to keep animals. For example, one woman has six goats and three chickens. She sold two goats to pay for clothes and she sold seven chickens to pay for sauce ingredients and to go toward paying for some clothes.

5.5.4 Household consumption

For the majority of the Mossi, the harvest lasts the households the whole year. The harvest is stored in granaries with the cereals being stored still attached to the seed head (like corn on the cob), some with, some without chemical treatment. The bambara nuts and cowpeas are stored with ash, sometimes the cowpeas are stored in earthen ware pots. The groundnuts and sesame are stored in sacks in the house.

Table 5.12 Typical Mossi consumption rates in Lon for a range of crops, in percentage values of total produced

	Maize	Millet	Sorghum	Sweet Potato	Groundnut	Cowpeas	Cotton
Eaten	95	95	95	90	40	47.5	100
Sold	5	5	5	10	35	45	0
Seed	0	0	0	0	25	7.5	0

Source: Author's fieldwork, 1993-1995.

Table 5.12 shows that the Mossi grow a smaller range of crops compared with the Nuni. They also sell a larger proportion, including some of the staple cereals. Cotton is their main cash crop, with proportions of their cowpea and groundnut harvest contributing to the household's cash income from the sale of agricultural produce. Meat consumption varies in its frequency of consumption; there are approximately half the Mossi families eat meat every three to six days, the other half eat it once every two to three weeks. Like the Nuni, the Mossi rely heavily on gathered wild foods to supplement their To staple. Wild fruits also provide additions to their diet (see table 5.13).

Table 5.13 A typical Mossi food calendar in Lon

Month	**Diet**
January - February	White sorghum To, rarely cowpeas and bambara nuts, dry sauce of okra, sorrel, *kapokiér*, baobab flour, fruits of detarium and **ganka**.
March - April	Millet To, dry sauce of okra, sorrel, *kapokiér*, baobab flour, fruits of detarium, néré, leaves of **katepoadga** and **kankalga**.
May - August	Millet To, cowpeas, bambara nuts, maize, fresh okra sauce, sorrel, bean leaves, fruits of karité, liana and wild grapes.
September - October	Maize To, fresh sauce, bambara nuts, maize, cowpeas.
November - December	White sorghum To, cowpeas, bambara nuts, yam, sweet potato, dry sauce of okra, sorrel, bean leaves and *kapokiér*.

Source: Author's fieldwork, 1994-1995.

5.5.5 Household income and expenditure

Unlike the Mossi from the other villages only a small percentage of the Mossi from Lon hire labour. The small number of Mossi that hire labour, do so to help with the cotton harvest. For example, one Mossi farmer hires the women's group (of 70 members, both Nuni and Mossi) to harvest his cotton at a price of 5,000 FCFA per day for the entire group.

The Mossi spend approximately the same amount of money on cotton inputs as the Nuni. The average Mossi household spending 11,000 FCFA on cotton fertiliser, 12,000 FCFA on insecticide and 750 FCFA on seed treatment. They also spend and average of 250 FCFA on non-cotton seed treatment like the Nuni and about half the farmers pay anything up to 10,000 FCFA on maize fertiliser.

Only one Mossi woman hired labour in the 1993 to 1995 seasons and that was because of ill health. She hired the student group (*groupement des eleves*) for 1,250 FCFA for one day. None of the Mossi women take credit.

The Mossi men sell cowpeas, groundnuts, sesame, sweet potato and animals on the market and their cotton to SOFITEX. They sell these items at the Tô market. They spend their money on clothes, medicine, sauce ingredients, school fees, bicycle repairs, agricultural tools, credit repayments, travelling expenses and seeds. Their biggest expenses are school fees, clothes and bicycle repairs.

The Mossi sell their cereals in August (of the next season) if there is a surplus. Fresh groundnuts are sold after the harvest in August, like the Nuni, and dried nuts are sold in June to provide agricultural spending. Cowpeas are sold in January to March and Bambara nuts are sold in May or June. Cotton is sold in January or February to SOFITEX. This spread of sales ensures distribution of monies throughout the year.

The Mossi women sell the harvest and animals in the home and at the market, along with **soumbala**, karité nuts and néré seeds. They spend their money on group contributions, travelling expenses, sauce ingredients (including Maggie (food stock) and salt), medicines,

clothes, beauty products and pots and pans. Their biggest expenditure is on travelling expenses, clothes, sauce ingredients and beauty products.

5.5.6 Women's timetables

The Mossi woman's timetable is slightly less differentiated compared with the Nuni woman. They also have more time for individual activities, if they are not involved in teasing the cotton (Mossi are traditionally weavers and reserve some of their cotton to weave their own cloth). Similar to the Nuni there role is first and foremost to ensure household functionality.

The following two tables outline the Mossi women's daily activities.

Table 5.14 A Mossi woman's typical daily timetable in Lon

Time	Activity
5 - 6	Heat water, sweep the yard,
6 - 7	prepare porridge for breakfast,
7 - 9	wash the pots and fetch water,
9 - 10	pound millet to flour,
10 - 12	prepare the midday meal,
12 - 4	tease cotton or individual activities,
4 - 5	grind flour, fetch water,
5 - 8	prepare the evening meal, wash the pots, heat water, eat food,
8 -	rest and sleep.

Source: Author's fieldwork, 1994-1995.

Below is the Mossi woman's yearly timetable which is also less differentiated than the Nuni woman's. Making karité butter and **soumbala**, like the Nuni, dominate women's activities. Cotton teasing is also a major activity.

Table 5.15 A Mossi woman's typical yearly timetable in Lon

Month	Activity
January - February	Selling karité butter and nuts, **soumbala**, tease cotton, collect potash.
March - April	Harvest néré, make and sell **soumbala**.
May - August	Help men on the farm, collect karité nuts and make butter.
September - December	Harvest crops, make soap, karité butter, collect potash and *kapokiér* .

Source: Author's fieldwork, 1994-1995.

5.5.7 Reaction to the Nuni

The Mossi no longer farm in the manner they did in the north and this has partly been due to them copying the Nuni. The main technique which has been adopted by the Mossi is *buttage*. The Mossi also say that the Nuni are beginning to copy some of the Mossi ways. There seems to be a marriage of farming systems. The Mossi say they like living with the Nuni, life is good and they all work together.

5.6 The Fulani of Lon

5.6.1 First arrivals

The Fulani first arrived from the north of Burkina Faso, from the province of Sanmatenga. The average Fulani family is made up of the family head and two wives and six children. The Fulani have a large household unit which usually consists of five men (the household head and either his brothers, his sons or a mixture), five women (the wives of some of the men) and six children. Each household has lost, on average, four children; two boys and two girls, due to death through childhood illness. The male children and the men all participate in animal herding activities while the women are traditionally connected to the home camp but are also in charge of selling milk and its products.

5.6.2 The Fulani production system

There are two separate Fulani communities in Lon; one to the east and one to the south. Like the other Fulani, they farm around their camps, with an average field size of 1.5 hectares. The Nuni chief gave them the land on which to farm and set up camp. They farm the same piece of land for two years, after which they allow their cattle to graze on it for two years, then they farm it again. They leave fruit and fodder trees in the fields, leaving proportionally more than the Mossi but slightly less than the Nuni. The Fulani have not changed their agricultural techniques in the recent past, although in the distant past they never used to farm. The Fulani women do not farm but they help their husbands with the harvest. As can be seen from table 5.16, the Fulani keep agricultural work to a minimum, freeing as much time possible for looking after the herds. They mostly cultivate cereals.

Table 5.16 A typical Fulani agricultural timetable in Lon

Month	Activity
January - March	No farm work.
April	Field clearing.
May	Sow white sorghum, millet and maize.
June	Resowing and crop upkeep.
July - August	Crop upkeep.
September	Harvest maize.
October - November	Harvest sorghum and millet.
December	No farm work.

Source: Author's fieldwork, 1993-1995.

The Fulani are not part of a formal group although they do come together to help each other vaccinate their cattle. They usually work in groups of ten for this and they are sometimes joined by the Mossi. The Fulani women come together to pound the millet together. This is usually done in family groups. The harvest is also done in the family group.

5.6.3 Animal husbandry

The rationale for animal rearing by the Fulani is complex and is embedded in their cultural heritage. Therefore, in this section the objective is to provide examples of what the animals are used for (table 5.17) rather than the reasons behind why animals are kept.

The Fulani of Lon have the largest herds of the three villages. The average herd per family is made up of about 70 cattle, 10 goats, 60 sheep, 20 chickens and 40 guinea fowl. Animals are used for a range of purposes, from subsistence to savings accounts, and this complexity can be seen in table 5.17. As can be seen from the table, considerable amounts of money is generated through the sale of animals.

Table 5.17 Examples of the revenue and purpose of Fulani animal sales in Lon, 1994

Example one	**Example two**
I sold: 3 cows between 30,000 to 75,000 FCFA each to pay for vaccinations and cereals (140,000 FCFA); 5 goats for 3,500 FCFA to pay for clothes, bicycle repairs and sauce ingredients (17,500 FCFA); 10 chickens for 450 FCFA (4,500 FCFA) and 7 guinea fowl for 600 FCFA (3,600 FCFA). **Total: 165,600 FCFA**	I sold: three cows for 150,000 FCFA for cereals and vaccinations; 10 sheep for 6000 FCFA for clothes and bicycle repairs (60,000 FCFA); 40 chickens for 600 FCFA each to pay for cola nuts and tobacco (24,000 FCFA); 30 guinea fowl for the same reasons at 750 FCFA each (22,500 FCFA); about 1000 guinea fowl eggs (3 for 50 FCFA) (17,000 FCFA). **Total: 273,500 FCFA**

Source: Author's fieldwork, 1994-1995.

The sheep and cattle are taken five or six kilometres to find pasture in the dry season. The goats are tied up and pastured near the camps and the fowl are kept around the house and given cereals, scraps and termites. Table 5.18 shows the reproduction rates of the different animals.

Table 5.18 Reproduction rates of the different animals in Lon

Animal	Reproduction rate
Cattle	One calf every one or two years depending on diet and climate. Depending on the size of the herd, each year can see an increase of between 10 and 20 calves.
Sheep and goats	Twice per year giving birth to an average of two kids/lambs. This gives an increase of between 20 and 30 per year.
Chickens and guinea fowl	These lay three to five times per year producing 9 to 13 chicks each time. Egg production can be anything from 400 to 1,000 per year, and depending on need, the eggs will be allowed to be incubated, on average, to produce 50 new fowl per year. The rest of the eggs are usually sold or given as gifts.

Source: Author's fieldwork, 1994.

It is clear that the larger the herd, the higher the reproduction rates and the higher the possibility of a high turnover of animals, i.e. the larger the herd (the larger the proportion of female animals) the higher the reproduction rate and thus the higher the amount of animals available for sale or available for restocking herds that may have been depleted by disease or loss.

Some Fulani women keep animals, although it is restricted to fowl. For example one Fulani women has four chickens, she sells two or three per year for 500/600 FCFA each to pay for sauce ingredients.

5.6.4 Household consumption

The crops are stored in straw granaries on the head with no pre-treatment against insect or fungus attack. The crops usually last in the granaries until May or June at which point they have to sell one or two cows to pay for cereals.

Table 5.19 Typical Fulani consumption rates for a range of crops in Lon, in percentage values of total produced

	Maize	Millet	Sorghum
Eaten	100	100	100
Sold	0	0	0
Seeds	0	0	0

Source: Author's fieldwork, 1993-1995.

Table 5.19 shows that Fulani agriculture is entirely subsistence oriented and no crops are sold. The objective of Fulani agriculture is to produce as much grain as possible that will last as long as possible, thus taking some pressure of the herds.

Meat is eaten once every two to four weeks and food is eaten in the mornings and evening only. The Fulani say that in the past they did not eat meat, only milk. But presently, milk is becoming scarce so they have to eat meat in February and May when milk is at its most scarce. From table 5.20 it can be seen that milk only is available for six or seven months of the year. The table also shows the difference between the diets of the Mossi and Nuni and the Fulani. The former two do not have milk as a part of their diet and the Fulani have a lower reliance on gathered foods, although they do, nonetheless, play an important part.

Table 5.20 A typical Fulani food calendar in Lon

Month	Diet
January - February	White sorghum To, milk, dry sauce of okra, *kapokiér*, baobab leaf flour, fruit of **ganka** and detarium.
March - May	White sorghum or millet To, dry sauce of okra and baobab leaf flour, milk is rare, néré, liana and wild grapes.
June - August	White sorghum To, milk, fresh okra, sorrel and bean leaf, karité fruits.
September - October	Maize To, milk, fresh okra and sorrel sauce.
November - December	Maize To, dry sauce of okra, *kapokiér*, baobab and milk becomes scarce.

Source: Author's fieldwork, 1994-1995.

Women collect all dead wood for firewood except *D.mespiliformis* (because it holds religious connotations for the Fulani, it is from this wood which they make their herding staffs) and karité. They use supple green wood (**yiilse**) to shape their huts which are made

every two years. They build the cattle corrals out of dead wood and thorny bushes every one to two years. This wood can be found in a radius of 0.5 to one kilometre away from their camp because they live in an area of good quality woodland. The huts are made at the beginning of the rainy season and repairs are made in the dry season. Granaries are made in September or November and the biggest jobs of the year are building the huts and corrals.

5.6.5 Household income and expenditure

One Fulani in Lon hires full time labour because he is handicapped. He spends 50,000 FCFA per year to hire someone to farm for him. Other Fulani may hire Nuni or Mossi labour when needs arise, to weed a field for example. The Fulani (men or women) do not take credit.

The Fulani do not buy any inputs, instead relying on cattle manure for fertiliser. They also do not cultivate cotton and so do not buy any of the cotton inputs like the Nuni and Mossi.

The Fulani men spend their money on cereals, clothes, sauce ingredients, human and animal medicine and bicycle repairs. Their biggest expenditure is on vaccinations, clothes and cereals. They sell the cattle at Lon to travelling cattle salesmen and the smaller animals at Tô market. The women sell chickens, milk in the rainy season and karité nuts at the Lon market. They buy sauce ingredients, clothes and beauty products.

5.6.6 Women's timetables

A large part of the Fulani woman's daily routine is spent extracting and treating the milk from the lactating cows when they are in season. Women from the three ethnic groups have different dominant daily activities that contribute to the respective household securities; for the Nuni it may be making karité butter, for the Mossi it is farming and for the Fulani it is preparing milk products.

Table 5.21 A Fulani woman's typical daily timetable in Lon

Time	Activity
5 - 7 am	Heat water,
7 - 9 am	treat milk, prepare breakfast,
9 - 10 am	fetch water and wash the pots,
10 - 11 am	pound millet,
11 - 12 p.m.	collect wood,
12 - 3 p.m.	rest and individual activities,
3 - 5 p.m.	grind flour, fetch water,
5 - 8 p.m.	prepare for evening meal, treat milk, eat, wash up,
8 -	rest and sleep.

Source: Author's fieldwork, 1994-1995.

The information presented in table 5.22 reinforces that fact that most of the Fulani women's activities revolve around the preparation of milk products for household consumption or for sale. Some collection of karité nuts takes place which is a relatively new activity for the Fulani women, having been picked up in Sissili on realising they are marketable items (and also perhaps as a replacement economic activity whilst their cows are not producing as much milk as they previously did.

Table 5.22 A Fulani woman's typical yearly timetable in Lon

Month	Activity
January - February	Burn millet stalks to make potash.
March - May	No specific activities.
June - August	Collect karité nuts, sell milk.
September - October	Help with the harvest, sell milk and karité nuts.
November - December	Sell milk if there is any, collect *kapokiér* flowers for sauce.

Source: Author's fieldwork, 1994-1995.

5.6.7 Reaction to the Nuni

Although the Fulani have not assimilated into Nuni or Mossi society, preferring to keep themselves to themselves, the Fulani do not have any problems with the Nuni and they say that life is good.

5.7 Ethnic interrelationships in Lon

Lon has the highest degree of tribal integration, i.e. cross-cultural contact. There is significant interaction between all the three tribes which shows not only cohesion but also a recognition that each contribution is important for the overall production system.

The Mossi receive most benefit from the Fulani and Nuni and the latter's contributions are important to the Mossi production system. The Mossi's relationships with the Fulani is strengthened because the two tribes have been cohabiting in the northern areas for a long time. For example, the Fulani visit the Mossi fields more frequently than the Nuni because of the former's increased familiarity with the pastoralist-agriculturalist relationship.

In many instances the presence of more than one tribe has made life alot easier for local and immigrant alike. For example, Cow dung is an important ingredient in plaster for the construction of houses or wall, and must be obtained. Farmers will go to the Fulani encampments in search of dung for plastering, and in general there is no payment (de Boer and Kessler, 1994). In the past this would have been a long process for the Nuni, with them having to gradually gather the dung from the few animals they owned. With the advent of the Fulani and their herds, this became much easier, improving the ease of this aspect of their production system.

In general it is only the Mossi that intermarry with other ethnic groups. The Mossi may commonly take Nuni wives because of their willingness to assume the language of the Mossi man (the vast majority of Nuni speak Mooré although it is uncommon to find a Mossi (or Fulani) who can speak fluent Nuni). It is unusual to find a Mossi woman with a Nuni man, most commonly because of the inability of the Mossi woman to speak Nuni and the unwillingness of the Nuni man to have a foreign tongue used exclusively in his household. However, occasionally there are Mossi woman-Nuni man intermarriages. For example, in the more cosmopolitan surroundings of Léo one of my key informants, a young Nuni farmer, took a Mossi woman for his second wife.

Table 5.23 Ethnic interrelationships in Lon.

Direction of transfer	Activities
Fulani ⟶ Mossi	• Cattle guarding. • Milk/meat sale. • Thatched mat sale. • Medical information. • Animal sale. • Dung. • Grazing animals on post-harvest fields.
Mossi ⟶ Fulani	• Labour. • Sale of cereals, foodstuffs, tools, etc. • Dolo.
Fulani ⟷ Mossi	• Participation in some decision making in communal village affairs (in village meetings some Fulani will participate, usually the elder males who have had most contact with the Mossi (and Nuni) through sale or guarding of cattle. • Cattle vaccination, either with or without an extension worker. • Celebration of religious festivals, marriages, baptisms, etc.
Fulani ⟶ Nuni	• Meat/milk sale. • Dung. • Animal sale. • Cattle guarding. • Medicinal information. • Gifts.
Nuni ⟶ Fulani	• Labour. • Sale of cereals, foodstuffs, **soumbala**, tools, etc. • Occasional loan of materials *sur place* (e.g. pestle and mortar). • Administrative control. • Land.
Fulani ⟷ Nuni	• Some participation in meetings, more listening that voting or discussing. • Participation in religious festivals and celebrations. • Some skill sharing. • Demonstrations of animal traction, veterinary issues, vaccinations, etc, with extension agent.
Nuni ⟶ Mossi	• Wives • Labour. • Administrative control. • Medicinal advice. • Land. • Sale of cereals, foodstuffs, tools, etc.
Mossi ⟶ Nuni	• Labour. • Gifts. • Sale of cereals, foodstuffs, some hardwares, etc. • Dolo.
Nuni ⟷ Mossi	• Skill sharing. • Labour exchange/sharing and knowledge exchange. • Equal participation in mens' and womens' agricultural groups. • Religious ceremonies. • Transport and trade. • Participation in decision making concerning, the use of currently (or about to be) used land.

Source: Author's fieldwork, 1993-1995.

This closeness of tribal interaction shows a growing maturity in a production system that has recently been interrupted. There is continuity and change within the village where the local production system mirrors entitlement exchanges that were once part of the broader spatial boundary exchange systems. This occurs while each ethnic group maintains its own basic agricultural system. In the following two villages, the levels of interaction are of a different nature, reflecting their respective stages in the development of a new production system.

6. VILLAGE CASE STUDY TWO: BOUTIOUROU

Chapter overview

This chapter presents the second village case study. The village of Boutiourou is smaller than Lon and in a more southerly position. The format of this chapter is the same as for the first village case study.

6.1 Boutiourou

6.1.1 Introduction

Boutiourou has a territory of approximately 24 km^2 and is composed of five Nuni cantons, one Mossi and one Fulani canton. The village territory shares borders with the villages of; Dabiou to the south-southeast, Kouri to the northwest, Longa to the west, Taaga to the west-southwest and Mouna to the east-southeast, to which there are good relations. Boutiourou has parental and marital links with the villages of; Sagalo (by the Zio family), Silli (by the Dahourou family), Sati (by the Kadio family) and Korobou (by the Nignan family) and also with Kation, Nianon, Dabio, Nadion, Taga, Woro, Longa, Kouri and Beune .

The landscape of Boutiourou is typical of Sissili: it consists of a succession of undulating granite plateaux, that often have hard laterite crusts on their summits and mid-slopes. It is a landscape which is characterised by sandy-silty soils than become more argillic towards the valley bottoms. These soils sustain a range of vegetation types; wooded savanna on the hill-tops; bushy savanna on the mid-slopes, riverine forest in the valley bottoms and aquatic prairies in flooded valley bottoms.

The majority of the population are Muslim, with a few Animist and Christian families. The common language of communication in the village is Mooré (the language of the Mossi immigrants).

Box 6.1 The oral history of Boutiourou

The village of Boutiourou, meaning the '*pancreas of the goat*', is estimated to be 400 years old. The first family to arrive was the Zio family who came from the village of Diona. One day, two brothers left Diona because they had argued with their third brother and the brothers took their belongings and their animal herd. After travelling some distance they found a green valley bottom where the soil was fertile and the water was constant, and it was here that they decided to settle. After some time another family arrived, the Dahourou family who came from Sati. They were then joined by the Nignan family. All three families, being together, decided to kill a goat for a small feast. The Dahourou and the Nignan family, after killing and cooking the goat, asked the Zio family which part of the goat they would like. The Zio brothers then said, "even if you were to give me the pancreas of the goat I will eat it and it will taste good." (The pancreas is traditionally recognised to be the least appetising part of the animal). This signified the bounty and peacefulness of the new village (even the bad parts are good). The Zio family became the Village Chiefs, the Nignan are the Land Chiefs and the Dahourou family are the village counsellors in charge of the streams and water.

Source: Author's fieldwork, 1994

6.1.2 Population

The population of Boutiourou numbered 77 people in 1975, 903 in 1985 and calculating from the number of homesteads, 1126 in 1995. The Mossi form the majority of the population, with 71 compounds, followed by the Nuni with 16 compounds, and in the minority by the Fulani with two encampments. The Mossi originated from the province of Bulkiemdé and Oubritenga in the Mossi plateau. The Fulani also came from Oubritenga, 17 years ago. The migrants left their regions of origin because of persistent droughts and the need to find fertile farm land. Seasonal out-migration from Boutiourou is common, and mostly composed of young men who look for work to pay for things such as a radio or a bicycle.

There are seven cantons in Boutiourou: five Nuni cantons, one Mossi and one Fulani, (see table 6.1).

Table 6.1 The cantons of Boutiourou, 1995

Canton name	Name of Canton chief	Position
Bankunliassan	Dahourou, Malik (N)	Village Counsellor
Zioliasan	Nignan, Adama (N)	Village Chief
Korouliasan	Nignan, Salif (N)	Land Chief
Kalanliasan	Kadio, Ali (N)	Family head
Cabueliasan	Kadio, Yaya (N)	Family head
Peulh[1]	Yabré (F)	Fulani 'Chief'
Ramongoliasan	Kaboré (M)	Mossi 'Chief'

(N - Nuni, M- Mossi, F - Fulani)

Source: Author's fieldwork, 1993-1995.

6.1.3 Description of the landscape

The village transect, figure 6.1, shows a highly managed environment, with the central Nuni village, unusually, on the top of the catena. The village, even though it is seen to be on the top of the catena, is not situated on the laterite or granite outcrop; it is on one of the landscape undulations. Usually, Nuni villages are situated nearer the valley bottom, on the more fertile soils of the lower slopes. Boutiourou is situated on the upper slopes because it moved from its original site, near the valley bottom, on conversion to Islam. The village moved the site of the village up-slope to physically remove themselves from their Animist past.

In the majority of areas along the transect, there has been a change in the natural vegetation, except for those areas near the streams (**poontia**). Here the relatively dense riverine vegetation has remained largely intact, characterised by *P.erinaceus* and *F.platyphylla*. Dry season gardening and riziculture have not developed in Boutiourou and consequently the semi-permanently flooded areas have been left alone.

[1] The fact that the Fulani settlement has no name, but simply 'Peulh' (the French translation of Fulani) may be significant. It may be due to the relative isolation of the Fulani settlement and (Fulani have relatively minimal contact with the Nuni compared with the Mossi), its potentially transient existence.

The first crops seen from left to right start after the dense riverine vegetation. These fields, up to the 'village green belt', are the Nuni's village fields where cotton, groundnuts, maize, millet and sorghum are grown. It is at the lower part of the catena that the old village was found. There are six different tree species on these fields with tree density remaining relatively high at about 40 trees per hectare. As of yet there are no introduced species that have been planted[2], although the Nuni will protect and cultivate néré wildings if found in the field. The village 'green belt' is a sacred site and acts (albeit accidentally) as a buffer zone between the cultivated area and the houses. The Nuni habitation zone sees an increase in the diversity of species from seven (in the bush) to 12 because of planted species which include mango (*M.indica*), *Gmelina arborea* (a service tree[3]), *Moringa oleifera* (a food tree), papaya (*C.papaye*), guava (*Psidium guajava*), teak (*Tectona grandis*) and banana (*Musa spp*). Household fields are also located in these areas and are dominated by maize cultivation. Animals and fowl are also kept around the houses, feeding on household wastes. Apart from the houses, the built infrastructure includes a mosque, a village savings bank, a tree nursery, granaries and a water pump. Past the village centre, the number of tree species again increases, which is partly due to a number of species being planted by the Village Chief (baobab, cashew (*Anacardium occidentale*) and mango) in his compound and partly due to the village men's group having planted *Eucalyptus camaldulensis*, *Cassia siamea*, and *G.arborea* for service wood as part of their group activities, as well as the existing natural vegetation. This is another area of village fields where the Nuni cultivate millet, groundnuts and red sorghum. Despite the level of cultivation in these areas there is still good tree cover. Further down the slope there is a patch of exposed laterite near to the main path running through the village which has been caused by excessive soil erosion caused by sheet erosion and gullying in the heavy showers of the rainy season. Past this area the vegetation becomes dense again with characteristic riverine vegetation. Around the stream there are only grasses as this area is completely inundated in the rainy season.

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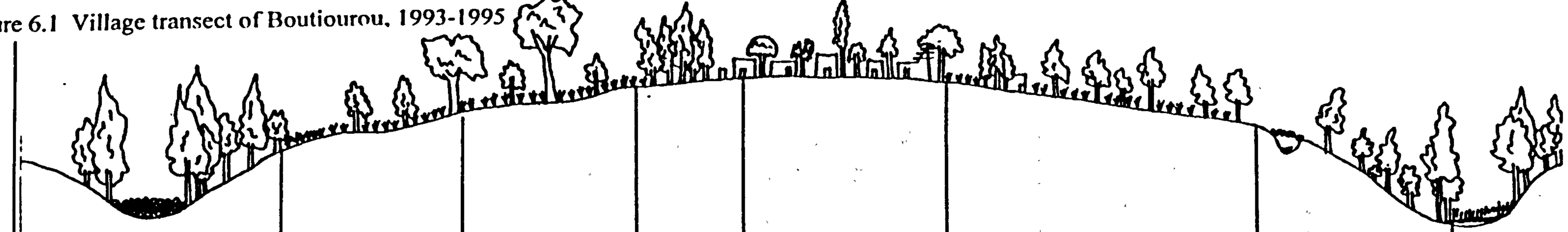
[2] Neem (*A.indica*) is an exotic species, originally coming from India. It is usually found under *Ficus spp* in dense thickets as a result of birds eating Neem seeds then roosting on large trees. The seeds are passed under the tree canopy with the birds droppings where they self seed.

[3] Many types of planted tree can be distinguished on account of their main purpose, e.g. the food and fruit tree; the woodfuel tree and the service tree (whose wood is used for building poles). However, although these trees are planted primarily for their first use, they are always multipurpose trees, being used for medicine, fuelwood, honey production, etc.

Figure 6.1 Village transect of Boutiourou, 1993-1995



Trees and Shrubs	Ficus platyphylla Parkia biglobosa Lannea microcarpa Piliostigma reticulatum Acacia polyacantha Combretum spp Diospyros mespiliformis	Butyrrospernum parkii Azadirachta indica Parkia biglobosa Lannea microcarpa Ficus gnaphalocarpa	Lannea microcarpa Acacia albida Ficus gnaphalocarpa Parkia biglobosa Azadiracta indica	Piliostigma r. Parkia b. Terminalia m. Combretum g. Velutinom spp. Diospyros m. Calabasse tree	Mangifera indica Lannea microcarpa Butyrospernum parkii Parkia biglobosa Gmelina arborea Vitex doniana Moringa oleifera Carica papaye Eucalyptus camaldulensis Psidium guajava Tectonia grandis Musa spp	Parkia biglobosa Butyrospernum parkii (Adansonia digitata Mangifera indica Anachardium occidentale)* Afzelia africana Detarium microcarpa Terminalia macroptera Gardenia spp Lannea acida Crosopterus febrifuga Combretum spp Landolphea spp Entada africana Diospyros mespiliformis Khaya senegalensis	Butyrospernum parkii Balanites aegyptiaca Lannea acida Combretum spp Pterocarpus erinaceus Piliostigma reticulatum Gardenia spp Parkia biglobosa Sterculia setigera Acacia machrostachya Acacia dudgeoni Khaya senegalensis Mitragyna inermis	Grasses
Remarks	Dam, stream	Cotton, groundnuts, sorghum Site of old village	Maize, millet, groundnuts Site of old village	Village green belt	Maize animal rearing: sheep, goats, fowl Nuni village centre: mosque village savings bank, tree nursery, granaries, water pump	Finger millet, groundnuts Millet Sorghum Village chief's house Farmland and fallows – good tree cover Reforestation with Eucalyptus camaldulensis, Cassia siamea, Gmelina arborea * planted by village chief	Two locally made bridges, streams in valleys. Exposed laterite on slopes	River bed.

Source: Author's fieldwork, 1994

6.1.4 Evolution of the farmed area

The farmed area in 1955, as seen in figure 6.2, was minimal. Although no population figures exist for 1955, considering in 1975 there were only 77 inhabitants, the population could not have been bigger than 30 (using the size of the farmed area as a reference). Although the village is just west of centre (where the village fields are found), much of the farmed area is to the southeast of the territory. There is also some farmland to the northeast of the village centre (both these farmed areas are the Nuni bush fields). Most of the farmed area is near the valley bottoms which is the Nuni's preferred farming area and the most fertile land. The fields to the northeast of Boutiourou's territory belong to a family from Sagalo. The presence of other village's fields in others territories is relatively common and the reasons are often lost or forgotten but the agreements hold. Note the position of the village in 1955 and the difference to 1983; this is the village move due to the conversion to Islam.

In 1983, the farmed area increased significantly and there is the first evidence of the impact of the Mossi immigrants. The Fulani have also arrived by this time and have settled to the southeast of Boutiourou's territory. There are two separate Mossi immigrants in Boutiourou's territory; the Mossi from the village of Taga[4], to the far west of the territory and the Mossi of Boutiourou to the centre west (the two Mossi contingents are separated by a stream). These Mossi came from the north to the village of Taga and asked the Land Chief if they could settle there. Those Mossi then moved, without the knowledge of the Land Chief, onto the territory of Boutiourou. On realising this, the Land Chief from Taga went to see Boutiourou's Land Chief to explain and Boutiourou's Land Chief agreed to let the Mossi stay. Another Mossi group (who became the Mossi of Boutiourou) came to see the Nuni Land Chief from Boutiourou directly and were given land. Progressively as more Mossi immigrants came to see the Nuni chiefs, the Nuni decided to give the Mossi a section of their territory to confine themselves to and to manage. The Nuni chiefs 'gave' the Mossi chief (the head of the first Mossi family to arrive) part of land between the two streams to the southwest. It was made clear that the Mossi would receive no more land. Consequent Mossi arrivals had to see the Mossi chief first to see if there was any available land in the Mossi territory. If there was land for the new migrants, then the Mossi chief would direct the

[4] When a group of Mossi arrived at a Nuni village and asked for permission to settle and farm, these then become the Mossi of that particular village, e.g. the Mossi from Taga, the Mossi from Boutiourou, the Mossi from Tô, etc.

immigrant to the Nuni Land Chief to seek his permission. The Nuni regulated immigration and forced the Mossi to regulate affairs on their own land with regard for the other members of the community (both Mossi and Nuni). The Nuni have bush fields close to the Mossi territory (again on the best land near on the lower slopes) to the west. In this way the Nuni could survey and monitor the Mossi activities.

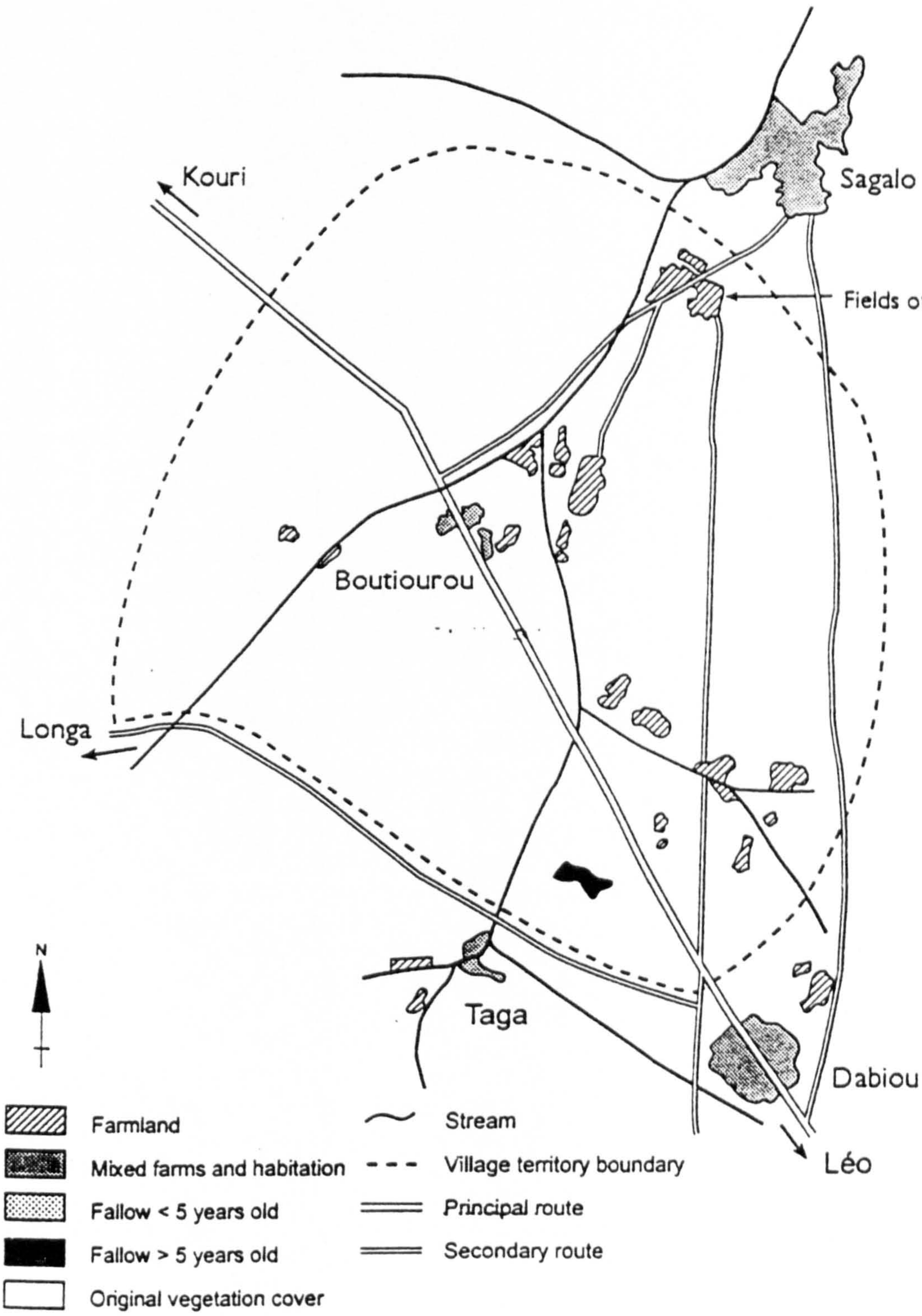
The Fulani have been allowed to settle in an isolated spot to the southwest of the territory. Here they are near to a water source and their cattle are removed from the cultivated areas. Here they can live in peace and cause minimal damage with their cattle.

The Nuni have left those bush fields on the lower slopes, to the south, fallow and have moved upslope to the east and also to the north. The village fields have remained on the site of the old village on the lower slopes. The Sagalo fields have become smaller, although the village of Sagalo has got noticeably bigger (as have Taga and Dabio).

Although there are fields of three Nuni families in the north of Boutiourou's territory, the Village Chiefs have designated this a forest reserve. This area provides for forest products and more importantly provides their children with farmland. This area was designated a reserve (no immigrant and only a few Nuni are allowed to farm there) through the realisation that population pressure may threaten the future of farming in Boutiourou's territory and thus, there is a need to conserve quality land for the future. There has also been an increase in the number of paths and tracks in the territory. This means both more people and traffic but also more contact between villages.

Figure 6.2 The evolution of the landscape in Boutiourou, 1955 to 1993

A. 1955

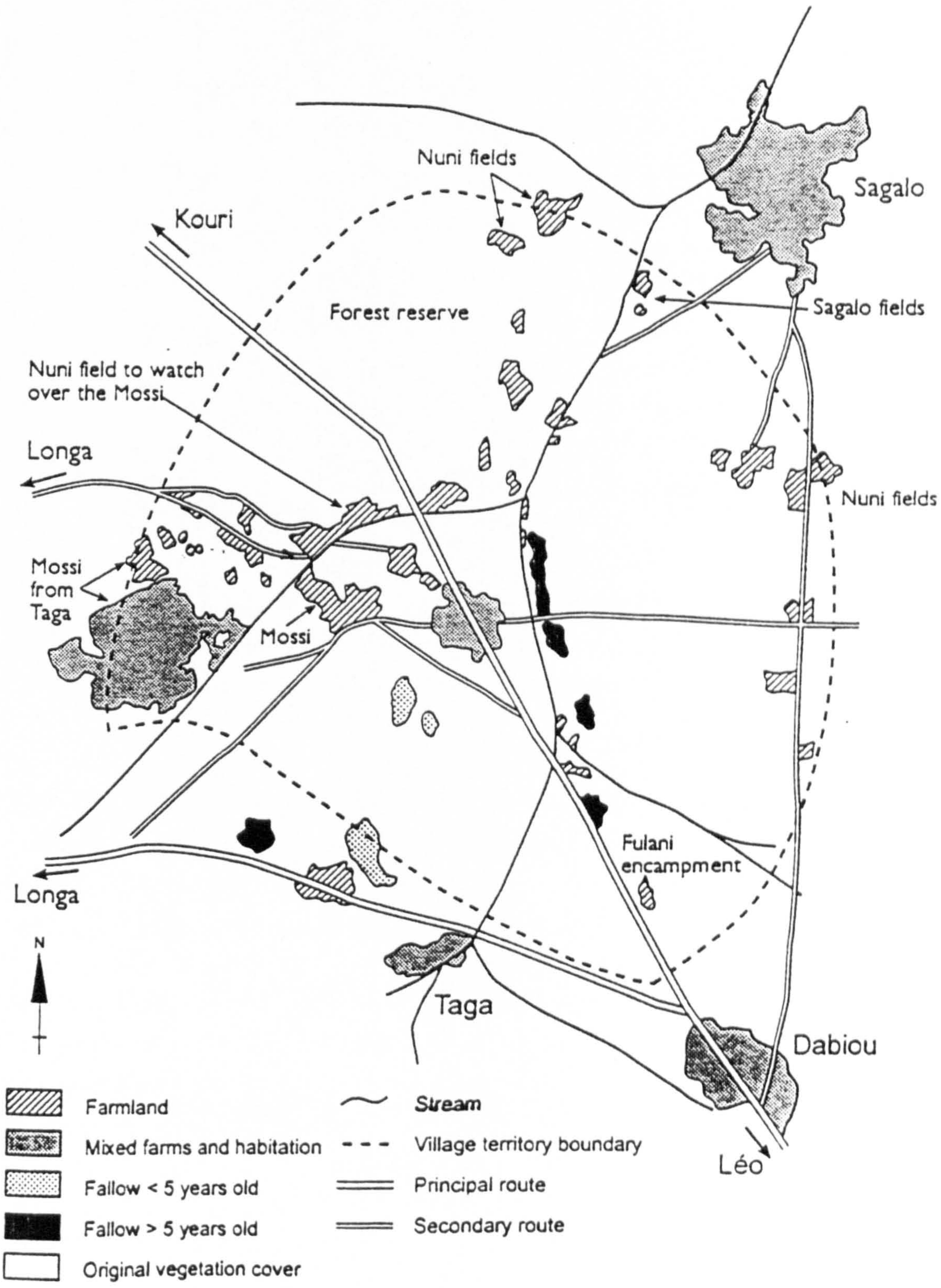


Maps are based on the interpretation of aerial photographs and maps and ground verification through interviews and observation, see text for explanation

Source: Author's fieldwork, 1993-1995

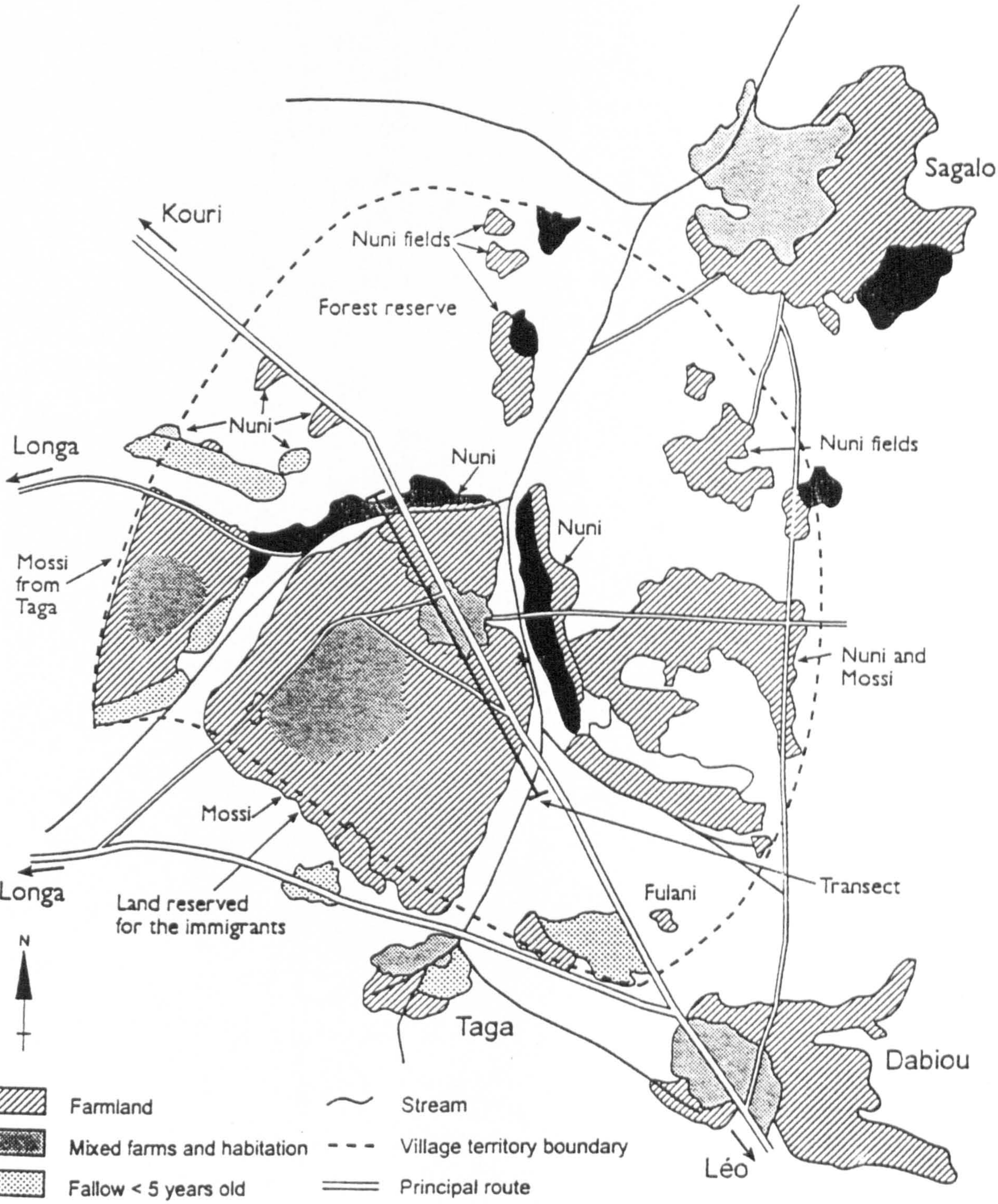
Not to scale.

B.1983



Maps are based on the interpretation of aerial photographs and maps and ground verification through interviews and observation, see text for explanation

C. 1993



Maps are based on the interpretation of aerial photographs and maps and ground verification through interviews and observation, see text for explanation

In 1993, there is a radically different picture with an expanded farmed area, most notably with the Mossi from Boutiourou. The Mossi from Boutiourou have almost completely filled up their allotted space with farm land. Some of the Mossi now have their bush fields alongside the Nuni fields to the east. The Nuni have left the lower slopes to the west (the old surveillance fields) fallow and have now returned to some of the fields on the lower slopes next to the streams to the centre east and southeast. Some of these areas remain fallow and have almost regenerated to a natural state. There has also been a large expansion of farmed area to the east by the Nuni and some Mossi farmers. The three Nuni families have kept their fields in the forest reserve, leaving two fields fallow and five Nuni fields have been cleared to the west in the mostly empty area. The Mossi of Taga have remained static and have not invaded elsewhere.

The Fulani have also remained static and are still surrounded by a relatively large expanse of bush; enough to pasture their cattle. The villages of Dabio and Sagalo have grown significantly with Taga growing to a lesser extent.

6.1.5 The future of the occupation of space in Boutiourou

Boutiourou has the second largest population of the case-study villages and has the second largest surface area covered by farmland. The largest expansion of farmland came between 1983 and 1993 which indicates that many of their total immigrants arrived between that period and came to join the original (probably their own family members) Mossi. This is unlike Lon who already by 1983 had a significant amount of land under (immigrant) cultivation[6]. However, Boutiourou still has significant woodland stocks, (almost 66 percent) which includes an indigenous forest reserve. Again with this amount of woodland (i.e. potential farm land) and an emerging coherent social group structure, it is unlikely that resource shortages will become apparent in the near future.

[6] It seems that the more northern the village the earlier it welcomed Mossi and Fulani immigrants. The further south one travels the later the arrival date of the immigrants. This indicates that the later immigrants (coming as a result of the droughts in the late 1980s instead of the late 1970s) found the northern areas of Sissili saturated with immigrants and so were forced to come further south to find land. Therefore the latest arrivals are found in Saboué and earliest Lon, with Boutiourou in the middle.

Table 6.2 The growth in the different categories of land cover in Boutiourou, 1955-1993[7]

Total land area - 2397 hectares

	1955 ha	% of area	1983 ha	% of area	1993 ha	% of area
Farmland	93	3.9	204	8.5	810	34
Woodland	2299	95.9	2171	90.6	1462	60.9
Fallow <5 years	-	-	8	0.3	61	2.5
Fallow >5 years	5	0.2	14	0.6	64	2.6
Total	2397	100	2397	100	2397	100

6.2 The production and tenure system

6.2.1 Background

Similar to the rest of the province, three distinct farming types can be seen in Boutiourou that are the result of the different socio-cultural characteristics of the Nuni, Mossi and Fulani. Agriculture and animal husbandry are practised together throughout all groups, but the level of integration and intensity vary according to ethnic group. For example, small ruminant rearing is more developed with the Mossi. Agriculture is practised for and by the family group, with yam dominating cash cropping for the Nuni and cotton and groundnut for the Mossi. For the Fulani, cattle rearing dominates the production system, small ruminants and fowl are also kept and some crops are grown on old pasture zones. Mostly rudimentary farming tools are used, although now there are some ox-drawn ploughs that villagers will share or rent out to each other.

Other activities which contribute to food security or income generation include traditional fishing, forest gathering and artisanal activities (sculpting, mechanics, tailoring, rope making).

There are families which live in other villages (Dabio, Sagalo and Longa) who have fields in the territory of Boutiourou, and one family in Boutiourou has a field in Kouri's territory. There are two soils unique to Boutiourou (**bounoutia, petia** and **tapuana**) which are location specific

[7] Based on the interpretation of the diagrams of the evolution of the occupation of space.

similar to the soils that are unique to Lon. The Nuni elders recognise the following soils in the village territory.

Table 6.3 The range of soils in Boutiourou and their Nuni names[8].

Name of soil	Description
Bounoutia	"A sandy argillic soil with many trees and gravely soil, found towards Kouri".
Diga	"Soil on the hills, very poor, grasses and trees".
Dudulutia	"One doesn't find trees here that you can find in other places, undergrowth is stunted, small and limited".
Kapafounoutia	"Gravely soil, found near hills, with few trees and undergrowth".
Kasuloutia	"Very sandy soil, few trees and grasses, soil becomes infertile very quickly".
Petia	"Some rocks, trees, e.g. Karité and *Burkea africana*, abundant undergrowth".
Tagatia	"A soil ideal for tuber production".
Tapuana	"A white soil".
Varatia	"A hard argillic soil, found in the valley bottom".

Source: Author's fieldwork, 1993-1995.

The soils upon which the majority of Nuni agriculture is carried out are **tagatia, varatia** and in the **poontia** area. These soils are found in the north, northeast, northwest, and east of Boutiourou's territory. The land is farmed with a **daba** and the plough. The farmers commented that in the past the farmed area was less but the harvests were good, now however, the area farmed is bigger but the harvests are less. The villagers also say that today they are using modern agricultural techniques that were introduced by the Mossi.

Nuni animal herding is carried out either by the children or by Fulani who have taken charge of the Nuni animals. The animals are taken to old fields or open spaces around the village to graze, and up to 3km away from the village in search of water and pasture. When food is short (or when it is available) the animals are given household waste to eat or cereal stalks. The Nuni elders say that in the past, rearing animals was not an expensive activity; there was abundant pasture and ample water. Now, they say, it has become expensive because of vaccinations and there is the added risk of cattle theft.

[8] All the soil descriptions are essentially straight translations from the words of the Nuni elders.

6.2.2 Village Organisation

There are two types of structures that co-exist in the village: traditional structures and the modern structures introduced by the state or initiated by NGOs.

The Village Chief is from the Nignan family and also a Nignan family member is the Islamic religious leader (Imam). The Land Chief is from the Zio family. The Village Chief and Land Chief live in the neighbourhood of Zioliassan. There is also the Village Counsellor (known in the village as '*le responsable des marigots*') who watches over the water, he also gives advice and counsel to the Land and Village Chief.

Next to these traditional structures, are the two non-traditional village groups. The men's group, was created because of the need for a formally recognised organisation to receive outside assistance. At the time of its formation, it had 35 members. The president of the men's group is a Mossi, and the three other responsables are Nuni. The women's group is composed of all the women in the Nuni and Mossi communities, and was formed in the hope of receiving outside support. The cohesion of the men's group is stronger than that of the women's perhaps because the former receive continuing support from *Sixiéme* FED's NGO in a '*Gestion de Terroirs*' programme (CGTV). These two structures represent a certain homogeneity to the village and a good level of understanding between village members.

The village men's group in Boutiourou is highly mobilised and has carried out a multitude of activities over the 1993/1995 period. It is a mixed group containing both Mossi and Nuni (but no Fulani) and it operates in a coherent and cohesive manner. Their activities for the period include; the construction of a dam to the centre northwest of the village; construction and operation of a village savings bank in the Nuni canton (at the centre of the village); the installation and running of a village tree nursery with a capacity for 5,000 trees per season; an experimental field to try out new cropping methods; and the construction of two wells. The group usually come together every week at the height of the agricultural season to work on their experimental field for a morning. In cases of other work, the president of the group will simply call the group together, or call sections of the group to work on particular days on a rota system. The penalty for absence when it is an individual's turn to work is usually 2,500 FCFA.

The women's group has not received any support from external organisations because they feel that they are not sufficiently coherent and structured, the women say otherwise: "*la solidarité reigne entre nous*"[9] The women's group has a collective field (different from an experimental field which is used to test new farming techniques, the collective field is farmed for the maximum revenue, usually with groundnuts) and other farmers often hire the entire group for harvesting (charged out at 2,500 FCFA per day) and for collecting water for construction (at 200 FCFA per woman per day).

The village has five peasant agricultural trainers (three Nuni, two Mossi), two peasant foresters (one Nuni, one Mossi), eight masons (five Nuni, three Mossi), four potters (Nuni), two weavers (one Nuni, one Mossi), four artisans (Nuni), one tailor (Nuni), two women trained in the construction of improved stoves (one Nuni, one Mossi), four literate in French (one Nuni, three Mossi), and four literate in Mooré (Mossi).

6.2.3 Support organisations in the village

There are two government services that work with the village: the Service Provincial de l'Agriculture that provides training and demonstration in new agricultural techniques; and the Service Provincial de l'Elevage that provides veterinary services. These two services first came to Boutiourou in 1991, the SPA by the intermediary of an extension worker and the SPE by a technical agent, both living in Leo. The SPE punctually intervenes for vaccinations and primary animal health.

Boutiourou had, before the intervention of ADESSI and CGTV, only received support from a religious NGO which worked in mother and child health. A well was dug that never struck water and promises were made for food for work but never received.

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[9] "Solidarity reigns amongst us".

6.2.4 Village resources and infrastructure

The infrastructure and equipment in the village is divided into two: traditional and modern. The traditional includes those infrastructures that have been built without external support and are constructed of locally available materials. The modern infrastructure has been built with the assistance of external agents, these include the dam, the tree nursery, the village savings bank, two wells and two water pumps. It should be noted that these have not simply been 'gifts' as is the case in many development projects, rather they have been the result of a working contract between the external agent and the villagers. The villagers have contributed the majority of the labour and monetary contributions.

Boutiourou has 17 traditional wells that only have intermittent water and one dam in the valley bottom to the north of the village. The dam was in disrepair until the CGVT provided support in the form of training and a truck to transport stones for rebuilding the dam. The construction of the dam has taken two seasons, the first season for the heavy construction and the placing of stones and the second season for making it water-tight. The improved dam is aimed at improving water availability throughout the year, as normally the streams on either side of the village normally dry up relatively early in the dry season. The reservoir created by the dam is primarily for providing dry season drinking for animals in the village. Its presence also allows the possibility of dry season gardens which have been absent from Boutiourou in the past because of a lack of water.

The tree nursery was installed in the village with the assistance from ADESSI (see project description) and has a capacity to produce 5,000 seedlings per year. The nursery is run through the men's group but is open for the sale of seedlings for the whole village. The village savings bank was created in partnership with the CIDR (*le Centre International pour le Développement Rurale*). The whole community participated in this project, with the villagers constructing the building that would act as the bank. The CIDR provided strong boxes and training for two people who were elected by the whole community to act as a cashier and an accountant.

One cemented well (which has never had water) and one borehole and water pump, installed with the financial help from Islamic Development Aid were, until 1993 the only 'modern

infrastructures' of the village. The bore-hole and pump are well managed, with each family contributing 500 FCFA per year. The CGVT has provided Boutiourou with another concreted well and borehole with pump. The village has no school but has been promised one by the Prefect.

6.2.5 Changing times

The general feeling amongst the Nuni population is that conditions started to change around thirty years ago. In the distant past, people remember a sleeping sickness epidemic which killed many people in the area and also tribal wars between Boutiourou and Pongo. The strongest memory in people's minds, however, is the most recent drought of 1990.

Thirty years ago the influence of Islam first became apparent. In Boutiourou, this change over to Islam stimulated a physical moving of the village from near to the valley bottom to further up the slopes. The old village was considered 'dirty' because it held ceremonial sites within its confines as well as idols and fetishes. The villagers moved two hundred metres from the old site and reconstructed their houses. In place of the multitude of Animist ceremonies and festivals, the now predominantly Islamic population celebrate Ramadam, Tabaski, Mouloud and the Islamic New Year. The 'rules and regulations' of Animism that still apply are:

- there are certain sacred areas where it is forbidden to cultivate;
- there are sacred streams where only the Nuni can fish (and only at certain times of the year);
- the Village Counsellor decides on who can fish and who cannot;
- there must be no bloodshed in the bush;
- there must be no sexual relations in the bush;
- respect must be accorded when hunting and bush-burning.

The majority of the immigrants arrived in 1980, in the middle of the severe '16 year' drought. The Nuni elders say that the immigrants have destroyed much of the soil and the forest and they have also brought a new common language of communication, Mooré. However, the Nuni elders welcomed the immigrants because, in the word of the elders "*Nous sommes tous Burkinabé*[10]".

[10] "We are all Burkinabé".

The Nuni elders feel that the Mossi have helped them through increasing the size of the village and contributing to communal village work, i.e. by investing their own physical numbers and contributing their skills, resources and knowledge for the betterment and strengthening of the village. The Nuni particularly appreciate the introduction of new ways of farming that the Mossi have brought and also Islam. One elder said this when asked what he thought about the Mossi[11]:

> *"Now we must work hard to maintain the soil. They* [the Mossi] *have brought Islam which is a good thing, now what we ask of God, He gives us. Now we have become clean and we have left Animism that asked for many things like killing a cow to ward off death in a family".*

6.2.6 Village conflicts

There has been a minimal amount of conflicts in the village, which is partly due to the strong community coherence and the good Nuni and Mossi relations (as well as the chief's strong leadership qualities). When conflicts do occur they tend to be resolved (if the problem is worthy of counsel) by a collection of select elders and those concerned. The decisions of the village counsel are always respected. For example, in 1988-1989, there was a problem of over use of the only water pump in the village (that donated by Islamic Development Aid) by the Mossi and the Nuni. The situation had got steadily worse as more people began using the pump. Women and children were forced to queue and wait for several hours and often arguments would develop. The problem was resolved in council with the women's and men's groups and a timetable was worked out.

In the same time period (1988-1989), an external agency (SPET) identified the problem of deforestation in the village. SPET concluded that the Nuni and the Mossi were cutting down too many trees and consequently sent a forester to go and talk with the villagers. The problem in SPET's eyes still exists, although there was no 'conflict' identified by the villagers. However, the villagers did recognise this as a problem.

A frequent conflict is the problem of animals straying onto farmers' fields in the rainy season. This conflict is not just confined to the Fulani, although if their herds stray onto a field, the damage is likely to be greater compared with a few straying goats. During the rainy season all

[11] Translated by the author.

animals should either be tethered or taken elsewhere to feed (it is normally goats and sheep that are tethered and cattle are taken further afield to graze). If they are found straying onto a field, the damage will be assessed and the owner of the animal will have to pay damages. In Boutiourou, this usually happens a few times every season and the guilty party usually settles the damages.

In 1995, a new conflict became apparent. The neighbouring village to the south, Dabio, has traditionally been home to a few charcoal making families. In the past, these families cut the wood from Dabio's territory and supplied charcoal locally; there was no conflict while the activity was small scale. However, since the beginning of 1995, charcoal lorries have been coming from Ouagadougou to Sissili in search of charcoal to supply urban consumers. This market demand encouraged the local charcoal makers to step up their production. The charcoal makers from Dabio increased their production and consequently finished the 'charcoal' trees in their territory and have since started to come into Boutiourou's territory in search of these trees. The villagers from Boutiourou are not happy about this, and at the time of the fieldwork they were in the process of calling a meeting with the villagers of Dabio. In almost all cases village disputes are settled in the village.

6.2.7 Seasonal migration

The characteristics of seasonal migration in Boutiourou is much the same as in the other villages. It is widespread amongst the younger generation and the time of emigration is usually after the harvest. The destinations are also similar with Ghana for the Nuni, Côte D'Ivoire for the Mossi, and the big towns of Burkina Faso being the most popular destinations. Again, migration causes many problems in the village, it depletes the human resources of the village and those who migrate often return home with illnesses or psychological problems that cause extra burdens on already stressed families.

The villagers that remain in the village at the times of seasonal out-migration feel uneasy about the level of migration and would prefer it if they stayed at home, "to help the development of the village". The families who are affected tend to find it difficult when a family member travels

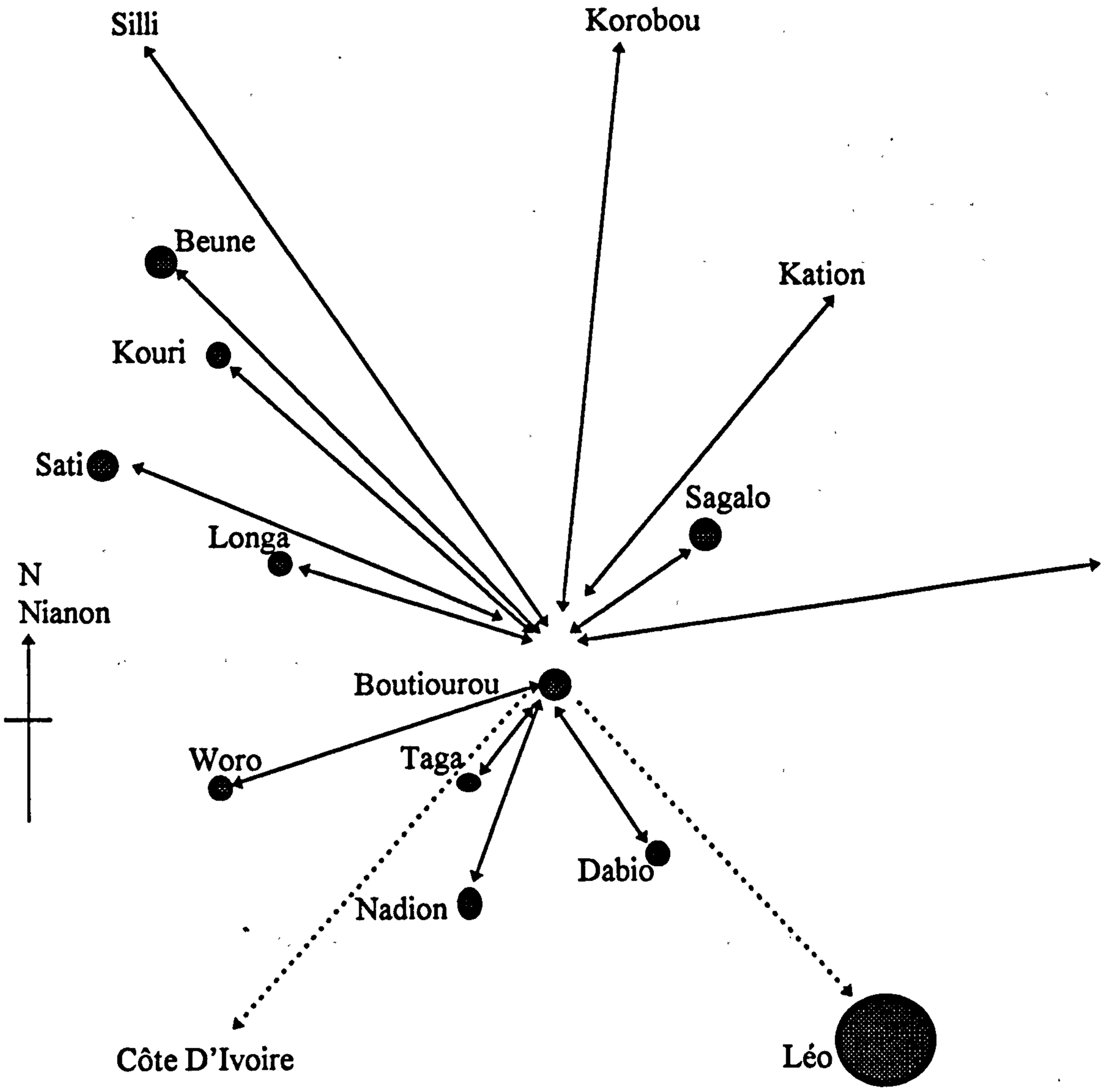
because of the extra work load. One villager said "if they tried they could get here what they wanted, instead of travelling to find it".

6.2.8 Networks and linkages of the Nuni

In Boutiourou, although the village is younger than Lon, it was originally made up of three families. There are thirteen links between Boutiourou and other villages because of either parentage or marriage, and two links because of relations living and working in other areas. It is widely held in Boutiourou that Côte D'Ivoire holds the greatest potential for making money. Léo, as it is so close and is a town with good income opportunities is also a favourite place. However, in the case of the latter, it is so close to Boutiourou that people can commute for business.

Both Boutiourou and Lon have significant links with other towns and villages in their areas. In the case of Boutiourou, its catchment of links is relatively close to the village, possibly echoing its more productive southern environment, i.e. people do not have to go too far to making a living and thereby need not spread their living risks through a wide area. In Lon, however, eight of the 13 links are more than 25 km from the village. Again, this may show the need to travel further afield in a less productive environment (Lon is just above the division between the sudano-sahelian (Lon and above) and sudano-guinean to the south) to increase the effectivity of the networks in their ability to provide alternate sources of livelihood if the need arises. Meillassoux (1981) says this is a common and obvious way of overcoming risk, i.e. by pooling the risks over a wide geographical area so as to cover ecologically heterogeneous zones and economic activities.

Figure 6.3 Networks and linkages of the Nuni in Boutiourou, 1995[12,13,14]



Source: Author's fieldwork, 1993-1995.

[12] All links are of a marital and parental nature with the exception of Léo which has additional administrative links with Boutiourou, being the departmental capital.
[13] The information for this map was obtained through interviews with village elders.

6.2.9 Networks and linkages of the immigrants

The Mossi of Boutiourou are from the provinces of Boulkiemdé and Oubritenga and have relations in Sissili (through marriage) and in Côte D'Ivoire through relations (see figure 6.4). They have no links with Ghana, as it is not a traditional destination for the Mossi (even though that is their tribal country of origin). Côte D'Ivoire has a high number of Mossi already working there so there is an element of safety in choosing that as the host country for seasonal migrant workers. The Mossi network in Boutiourou is very similar to that of Lon.

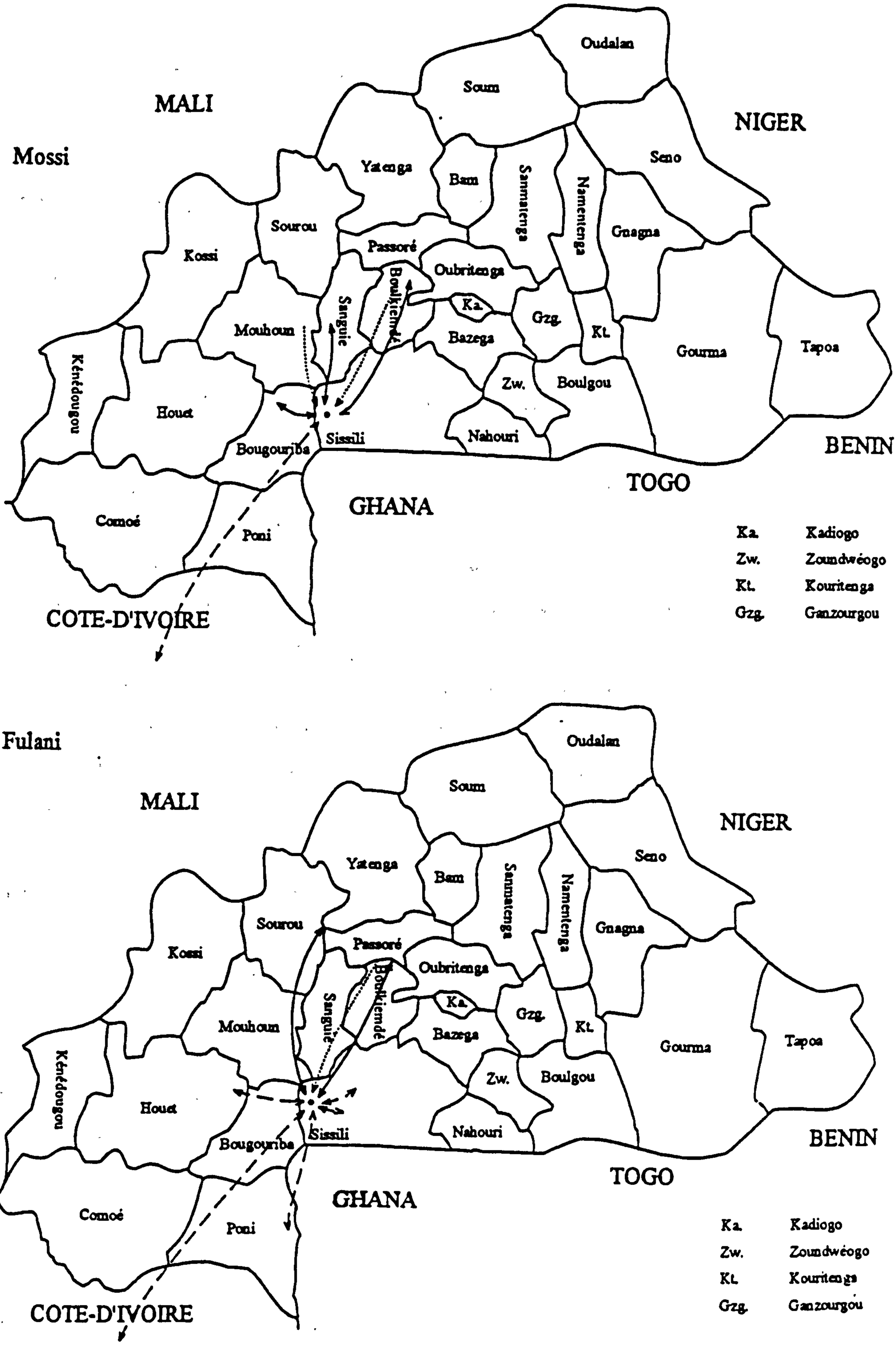
The Fulani of Boutiourou have a larger number of linkages than those of Lon. The Fulani are composed of one clan coming from Oubritenga and have links with Passoré province, Ghana (for the same reasons as the Fulani of Lon), Côte D'Ivoire and also with villages in Sissili. In addition to trade through Ghana, they also trade through Côte D'Ivoire, possibly because they are close to established trade routes that pass through the province of Poni into the Côte D'Ivoire. The Fulani of Boutiourou have been residents in the village for 17 years and as such have seen a number of their daughters married and hence the number of their links in the villages of Sissili.

6.3 Legal arrangements and administrative decision making

Boutiourou seems to have the most controlled and regulated legal and administrative system, with each of the immigrant groups being confined to specific areas and the existence of land or woodland 'reserves' that are for '*les enfants*[15]' (i.e. farms for the future). In figure 6.5 there is a diagrammatic representation of the power structures in Boutiourou, and although it seems very similar to that of Saboué, it is very different.

[14] The size of the circles are proportional to the size of the villages.
[15] 'the children'

Figure 6.4 The origins and linkages of the Mossi and Fulani in Boutiourou



These diagrams are based on interviews with Fulani and Mossi in the fieldwork 1993-1995.

Boutiourou has a significantly larger population, both Nuni and immigrant, and consequently has more land under cultivation (34 percent of its territory opposed to 13 percent in the case of Saboué), it also has a smaller area (2397 hectares opposed to 3731 hectares). It is perhaps because of this that the Nuni Chiefs of Boutiourou were forced into a tightly controlled system of land distribution and regulation of immigrants in their territory. The chiefs of Boutiourou also had the added factor that there were immigrant Mossi from another village (the Mossi of Taga) that occupied a small but nonetheless important part of their territory.

When the chiefs of Boutiourou realised that the northern Mossi immigrants were continuing to come in significant numbers in the late 1980s they reached the decision that they must reserve a part of their territory specifically for them. By doing this, they not only confined the Mossi to one specific delimited area, but they also regulated the number of immigrants arriving by putting the control into the hands of the original Mossi immigrant. The Nuni chiefs told the Mossi chief that the land they had given them was effectively 'theirs'[16] and it was now up to them to regulate their own affairs. They would in no way receive any more land. Therefore, it was in the Mossi's own interest that the land they had been given remained under an optimum population. Because of this limiting control, it was usually only the relations of the original Mossi that would be 'called' from the Mossi plateau or it would only be relations of the original Mossi that would ask. There would be communication between northern and southern Mossi before the arrivals or the Mossi chief may send back messages to his northern cousins saying that there is no more land left to farm.

The Mossi consequently have their small Mossi kingdom in Boutiourou which is regulated by traditional Mossi rules. Similar to Saboué, if there are problems which affect the wider population caused by a Mossi and which the Mossi chief cannot resolve, the offender is then sent to the Nuni chiefs which reserve the right to expel the offender from the village. Again, this rarely happens.

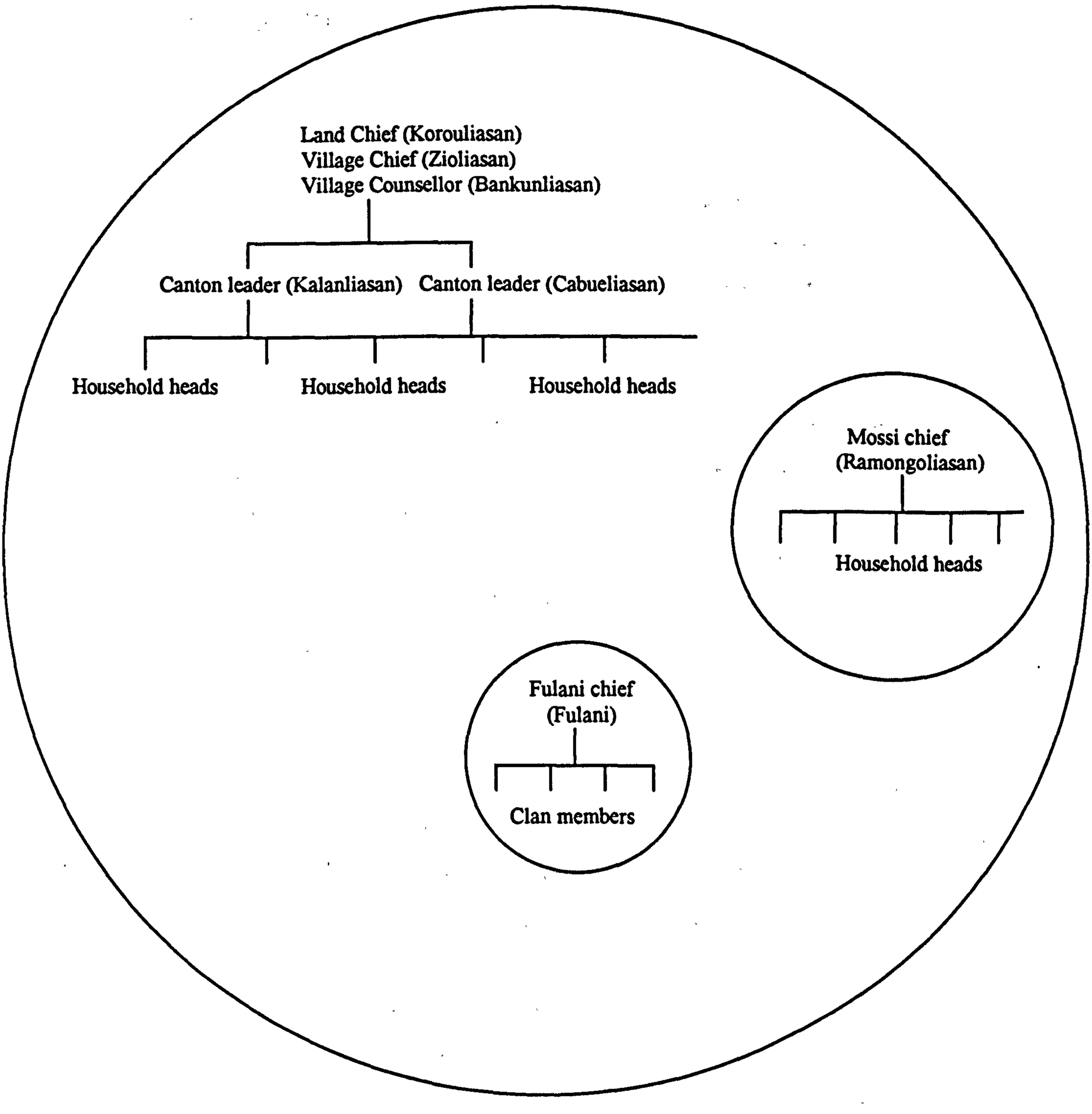
[16] Although all land belongs to the village and only usufruct rights exist, this 'gift' of land will probably never be reclaimed by the Nuni. Thus, in this sense it is lost land. However, returning to support networks, the greatest guarantee of subsistence is to provide another group or person with land, thereby allowing the giver to claim back on the land in times of hardship. It also puts the receiver into a situation of moral obligation with the giver.

The Fulani in Boutiourou have been placed to the southeast bordering with Dabio's territory. This has been done for a number of reasons. Firstly, the Fulani prefer to be isolated in their camps in the bush, where there is sufficient pasture. Secondly, the Nuni have put the Fulani there to discourage anyone farming, because of the risk of Fulani animals spoiling crops. The Fulani camp is simply called 'Peulh' and has not been given a personalised name. This, perhaps, indicates the belief by the Nuni that the Fulani will not stay very long in Boutiourou. Unlike the sedentary Mossi, the semi-nomadic Fulani always have the possibility of moving on to new pastures and setting up camp.

The three Nuni chiefs (the Land Chief, the Village Chief and the Village Counsellor), commonly hold counsel together, along with other elders and notables. The canton leaders are traditionally answerable to them and in turn the heads of household answerable to the canton chiefs.

Despite the apparently strong control and regulation that the Nuni chiefs have over Boutiourou's territory, there are some signs of traditional land use irregularities. For example, to the east of the territory there are now some Mossi fields. The reasons for their presence are the same for the intermingling of Nuni and Mossi fields in Lon; through increasing friendship and closeness the Nuni chiefs are allowing some Mossi (i.e. their friends) to farm alongside them on new land or their old fallows. This may signal a leaking of the Mossi onto new areas or may signal an ample amount of land that can afforded to be farmed and, again, through this, the subsistence networks and moral economy is strengthened.

Figure 6.5 A diagrammatic representation of the power structures in Boutiourou[17][18]



Source: Author's fieldwork, 1993-1995.

[17] The circles represent the respective territories.
[18] The original Mossi family head acts as the Mossi chief.

6.4 The Nuni of Boutiourou

6.4.1 The Nuni production system

The Nuni man in Boutiourou has two to three wives. On average they have 7 children with a higher female to male ratio. The average household number in Boutiourou is 14 people. In a household of this size it is normal to have lost three children (again a higher female to male ratio) due to death from disease.

The Nuni of Boutiourou have a security of tenure and the guarantee (originating from their respective ligneages) of the better land in their territory; they clear virgin bush or their parent's fallows for their farmland. They are more or less free to farm where they choose within the boundaries of their social position, although the formalities of offerings and respect to the Land Chief must be honoured. The soils which they cultivate include **tagatia**, **tezonou**, **tekassoulou** and **kasuloutia**, which are all medium to high potential with the exception of the latter which becomes infertile relatively quickly.

On average the Nuni in Boutiourou farm in total around 5.5 hectares, which is made up of 3 hectares in the bush, 2 hectares around the village and 0.5 hectares as a household field. The bush fields range between 1.5 to 4.5 kilometres away from the houses. Each land parcel is farmed from between 3 to 5 years and is left fallow from between 3 to 10 years. When a field is being prepared for the coming agricultural season the trees in the field are selectively cut leaving fruit trees, fodder trees and a big shade tree. Species that are left include; *D.microcarpa*, karité, néré, tamarind (*T.indica*) and wild grape (*L.microcarpa*). Bush fires are started in September and serve the purpose of discouraging snakes and encouraging the fruit trees to flower. Early bush fires are usually started around the houses by men (although never by women). Some farmers expressed concern that there is no consistency in the time of starting bush fires as there was in the past, and this is considered damaging. "Now there is disorder", one farmer said. Bush fire is still practised by some people but it is becoming a less frequent phenomena. The bush is increasingly important for pasture for the animals.

All the households interviewed said that in the recent past (from 10 to three years ago) they had changed their system of agriculture from a 'traditional' system to a 'modern' system. Below is a description of a typical Nuni agricultural year in Boutiourou. Unlike Lon there is no agricultural rest period, there is a continuous input of labour (albeit of varying degrees) in the agricultural landscape. Presently, in Boutiourou, cotton is competing for a share in the cash crop mix. Boutiourou was almost predominantly a tuber producing zone, but has now started growing cotton. This means that extra labour has had to be invested in the farming system.

Table 6.4 A typical Nuni agricultural calendar in Boutiourou

Month	**Activities**
January to March	Miscellaneous off-farm activities and rest period.
April	Field preparation and planting yams.
May	Sowing of millet, maize, beans and early groundnuts.
June	Sowing maize, cowpeas, white and red sorghum, cotton and the first weeding on the millet fields.
July	Sowing bambara nuts, groundnuts, sweet potato and general crop upkeep.
August	*Buttage* of maize, sorghum and millet, weeding in the yam fields, harvest of the first yams, preparation of new yam planting mounds for next year, harvest of early groundnuts.
September	Continuation of preparation of new yam mounds for next year, harvest of maize and beans and field preparation for next year.
October	Harvest red sorghum, millet, bambara nuts, cowpeas and groundnuts.
November	Harvest white sorghum, millet and sweet potato.
December	Harvest yam.

Source: Author's fieldwork, 1993-1995

6.4.2 Animal husbandry

Despite the new 'modern' way of farming, not everyone has cattle that are necessary for ploughing. Approximately one half of Nuni in Boutiourou own cattle, ranging in numbers from one to eight. Sheep and goats are more widely distributed with each family owning, on average, seven goats and five sheep. These are used for 'resolving problems' e.g. if a family member suddenly falls ill or if school fees need paying. Every household owns fowl, both chickens and guinea fowl. On average each household owns about 20 chickens (the maximum was 70) and anything from six to 20 guinea fowl. Fowl are used for food when entertaining visitors or for

small pocket money. Below are two examples of the uses of animals in the Nuni community illustrating the range of situations where animals are critical.

Table 6.5 Examples of the revenue and purpose of Nuni animal sales in Boutiourou, 1994

Example one	Example two
I gave one goat and one sheep as a dowry for my daughter. I killed one goat at my daughters baptism. I sold two sheep for 6,000 FCFA each and two goats for 5,500 FCFA to resolve family problems. I sold 5 chickens for 650 FCFA each for tobacco. **Total: 26,250 FCFA**	I sold one old cow at the market for 15,000 FCFA because it had become too old to work. I sold three sheep for 6,000 FCFA each to buy medicine for my family. I sold 15 guinea fowl to resolve small problems for 700 FCFA each. I killed one sheep at Tabaski and one goat for Ramadam. **Total: 43,500 FCFA**

Source: Author's fieldwork, 1994-1995.

Animal husbandry has traditionally been the domain of men, but increasingly women are beginning to keep fowl and small ruminants for extra revenue. Many of the women in the village have a few chickens, which, in the past would have gone to the husband, "now" they say, "we can do what we want".

6.4.3 Household consumption

The harvested cereal crops are stored in granaries which are made out of woven grass and supported by wooden poles with a conical woven grass roof, they are lined on the inside with a layer of hard mud. The red sorghum and the maize is kept on the head and stored in the granary without treatment (i.e. insecticide or storage product). The millet and white sorghum are stored as grains (i.e. the heads are 'beaten' to remove the grains which are then winnowed to remove the chaff and stored as 'naked' grain) with chemical insecticides and preservation enhancers. Cowpeas are stored in the granary with ash or with a herb (**bonbonla**) against insect attack. Yams are stored under a hangar in the family compound. Table 6.6 shows the proportion of crops that are either eaten, sold or reserved as seeds. Cotton is the only crop that acts purely as a cash crop. Other cash crops include groundnuts, cowpeas and yam.

Table 6.6 Typical Nuni consumption rates in Boutiourou for a range of crops, in percentage value of total produced

	Maize	Sorghum	Millet	Yam	Sweet potato	Groundnuts	Cowpeas	Beans	Cotton
Eaten	100	100	100	35	80	15	60	90	100
Sold	0	0	0	52	15	80	30	0	0
Seeds	0	0	0	13	5	5	10	10	0

Source: Author's fieldwork, 1993-1995.

The crops are sold at different times of the year to stagger the household's income: yams are sold from October to December, groundnuts are sold fresh in August and dried in March and cotton is sold in January or February to SOFITEX. The Nuni will conserve all the cereals for family consumption unless there is a family problem to resolve through money and there is no other resource in the household that can be sold.

Table 6.7 shows a typical Nuni diet over a year. Similar to Lon, gathered foods and fruits provide an important part of the diet.

Table 6.7 A typical Nuni food calendar in Boutiourou .

Month	**Diet**
January	Maize To at night, beans at midday, sauce made from dry ingredients of okra, *kapokiér*, baobab and sorrel leaves.
February - March	White sorghum To in the morning and evening, sauce made from dry ingredients of okra, *kapokiér*, baobab and sorrel leaves. Fruits of detarium and néré.
April	Millet To in the morning and evening, sauce from dry ingredients of okra, baobab and **kagnanou** leaves. Fruits of detarium and néré.
May	Sorghum To, sometimes yam, sauce of **boubalio** and sorrel leaves, porridge in the morning. Liana, wild grape, karité and néré fruits.
June	Sorghum To in the evening, cowpeas at midday or boiled maize, sauce made from fresh cowpea and sorrel leaves. Liana, wild grape, karité and néré fruits.
July - August	Millet To with fresh bean leaf sauce, sorrel, fresh maize and yam.
September	Maize To, yam, bambara nuts, some sweet potato.
October	Maize To, yam, bambara nuts, sweet potato, cowpeas, niébé leaves and fresh sorrel.
November - December	Maize To, beans, bambara nuts, dry okra, baobab leaf sauce and baobab flour.

Source: Author's fieldwork, 1994-1995.

6.4.4 Household income and expenditure

With the introduction of 'modern' agriculture, there has been a necessity to purchase various inputs; from fertiliser to insecticides. In the past it was unusual for a family to spend much money (if any) on agricultural inputs, relying instead on the land's natural fertility, household organic waste or animal dung. Today, however, farmers generally invest in fertiliser, seed treatments and insecticides. For example, those who cultivate cotton pay on average 10,000 FCFA per season on chemical fertilisers and 2,000 FCFA on insecticide. Fertiliser for other crops amounts to an average seasonal expenditure of 20,000 FCFA. The average household expenditure on seed treatment is 1,500 FCFA.

Farmers also hire seasonal labour, especially yam farmers. Preparing yam fields is very heavy work, each yam tuber being planted in a pyramidal earth mound, approximately one metre in diameter and one in height. A farmer will pay 5 FCFA per yam mound or 3,000 FCFA per day per person. Amongst the Nuni in Boutiourou this is the biggest requirement for extra labour; it is not possible to make 5,000 mounds using one family's labour in time for seeding without help. This labour may come from a variety of sources; youth groups from Boutiourou or Sagalo, or the **kampené** from Boutiourou. The range of tasks that also require extra labour include, weeding the yam fields. If a person has no way of paying labour costs but labour is still vital, work will be done by the village group as a form of loan. The person will then be expected to repay the group members through off-season work or part of his harvest. The 'repayment' of this form of loan will never be directly asked for but it will be paid back in kind, "*quand il a le moyen*"[19].

When money is needed, the most common things that are taken to market for sale are: yams, sweet potato, fowl, goats, sheep and old cattle. Cotton is sold directly to SOFITEX. Yams are sold in October or November, after they have been harvested. Cereals and cowpeas are only sold if there are sufficient stocks to ensure the family's subsistence or there is a grave family problem. Fresh groundnuts will be sold in August after the harvest and dried groundnuts will be sold in March. Avenues of expenditure include credit repayment, school fees, house repairs or construction, clothes, medicine, women's presents or investment in a bicycle or mobilette. Many farmers have ox-drawn ploughs taken on credit over 6 years that were provided by the CRPA.

[19] "When he has the means".

The Nuni women have a separate economy and produce, or are in control of, a range of items that they sell on the market. Women produce and sell, karité butter, fried cakes, **soumbala** and karité soap. They also sell grain (usually millet) and potash (for soap making). The Nuni women in Boutiourou have denied taking any form of credit, although this may be a result of a lack of credit facilities for women (ADESSI's women's project initiated a very successful women's credit scheme in other villages). Because of the monetary nature of many of female activities the exposure to credit facilities has often been shown to be highly effective amongst women's groups. Amongst women's main purchases are clothes, shoes, plates, beauty products, sauce ingredients (salt, sorrel leaves, Maggie), the biggest expenditures being plates and clothes. Clothes are bought after the harvest and plates are bought in the rainy season.

6.4.5 Women's timetables

The following tables give the normal daily activities of a Nuni woman and their yearly activities. The Nuni woman's daily timetable is highly differentiated and demonstrates the wide and diverse activities that she is involved in. She also has a shorter time period to devote to her individual activities, compared to the case-study villages.

Table 6.8 A Nuni woman's typical daily timetable in Boutiourou

Time	Activity
5 - 6 am	Heat water for washing,
6 - 7 am	prepare porridge,
7 - 8 am	sweep the yard, wash the pots,
8 - 9 am	fetch water,
9 - 11 am	pound millet, collect or buy sauce ingredients and start preparing for the midday meal,
11 - 1 p.m.	prepare midday meal and eat, wash the pots,
1 - 2 p.m.	fetch water and individual activities,
2 - 3 p.m.	fetch wood,
3 - 4 p.m.	pound flour,
4 - 5 p.m.	prepare evening meal,
5 - 6 p.m.	heat water for washing,
6 - 7 p.m.	eat,
7 - 8 p.m.	tidy up,
8 -	rest and sleep.

Source: Author's fieldwork, 1994-1995.

Despite the very busy schedule of the Nuni woman she is involved with many different activities over the seasonal cycle. As can be seen in table 6.9 the women's activities are dominated by the preparation and sale of néré and karité products. The only agricultural work that can be seen here is the help with seeding and with the harvest.

Table 6.9 A Nuni woman's typical yearly timetable in Boutiourou

Month	**Activity**
January - February	Make karité butter, **soumbala** and local soap.
March - April	Collect néré seeds and prepare seeds, pounding and sale of néré flour.
May	Start of karité season, preparation of **soumbala**
June - July	Collect karité nuts, sale of nuts, making butter and local soap, help on the farm.
August	Selling karité products.
September	Selling karité products and help with harvest.
October	Drying of okra and sorrel, harvesting.
November	Harvest
December	When harvest is finished, selling cakes and karité products.

Source: Author's fieldwork, 1994-1995.

6.4.6 Reaction to the immigrants

The Nuni relations with the Mossi are, in general, good. There is, as already has been mentioned, an appreciation that the immigrants have contributed to the development of the village. However, there are certain reservations that the Nuni take with the Mossi. For example, the Nuni do not like the way that the Mossi cut down the wild fruit trees, like *D.microcarpa*, néré and karité. The Nuni women have problems when the Mossi will not allow the Nuni access to the néré and karité trees on the Mossi land. They look upon the Mossi's farming system as the same way they farmed on the Mossi plateau; "they have lots of big fields". Sometimes the Nuni feel that these differences in lifestyle cause bad feelings between the two tribes. However, the Mossi are starting to imitate some of the Nuni farming practices.

6.5 The Mossi of Boutiourou

6.5.1 First arrivals

The Mossi in Boutiourou came from Boulkiemde and Oubritenga in the north of Burkina Faso. The first immigrants arrived in 1972, with the majority arriving in 1983/84 and the most recent in 1991. They have direct family relations in Côte D'Ivoire, Koudougou, Silli, To and Kabarou (the latter three all being in Sissili).

A Mossi's immediate family will consist of one man and two or three wives. Mossi have a higher number of children with households in Boutiourou having an average of 10 children, with an equal number of males to females. The Mossi household may consist of the head of the family with three wives and children who share the household with the husband's brother, who also has two wives and children. In this respect it is similar to the Nuni. It is, however, less common amongst the Mossi to find large household units, as is the case with the Nuni. It is more likely to find single family units than large extended family units. The average household size is twelve but numbers range from five to 20. They lose on average 4 children at an early age, two girls and two boys.

6.5.2 The Mossi farming system

The Mossi have household fields of around 0.25 hectares, village fields that vary between 1.5 to 2 hectares and bush fields of, on average, 3 hectares. Bush fields are, on average, 1.5 km away from the household. The Land Chief gave them the land to farm and the Mossi say this land is medium rich (**dagaré** and **baongo** soils) agricultural land with bush land called **zibole**. The Mossi have been on this land since they have arrived and have had no access to new areas to farm. Most farmers do not fallow their land because of the land shortage, instead, as a way of controlling soil fertility they practice crop rotation. They say that they do not burn the bush but they do cut fire barriers around their granaries to protect them from bush fire. When they are preparing their fields the trees that are left include the fruit trees, the *kapokiér*, caicedra (*K.senegalensis*) and a large shade tree.

Like the Nuni, the Mossi say that they have changed their way of cultivating from largely manual to using ploughs, fertilisers and sowing in line. They have also copied the Nuni technique of making mounds around their cereal crops and some farmers have started to cultivate yams.

Table 6.10 The Mossi's typical agricultural calendar in Boutiourou

Month	Activity
January - February	Winnowing of millet, upkeep of houses, mat weaving, protection of soil by covering surface with millet stalks.
March - April	Field preparation, upkeep of granaries.
May	Sow millet, white sorghum, yam, early groundnut and maize.
June	Sow millet, white and red sorghum, groundnut and maize, crop weeding.
July	Sow bambara nuts, cowpeas, sweet potato, groundnut, crop upkeep.
August	Sow bambara nuts, cowpeas, *buttage* of millet and white sorghum, harvest early groundnuts and maize, crop upkeep.
September	Harvest yam (if planted), maize, red sorghum, filling in compost pits.
October	Harvest maize, groundnut, cowpeas, sorghum and millet.
November	Harvest white sorghum, millet, sweet potato, filling in compost pits, preparation for next season, start of gardening season.
December	Yam harvest. House work, prepare for next season.

Source: Author's fieldwork, 1993-1995.

6.5.3 Animal husbandry

The Mossi have a longer tradition of keeping animals than do the Nuni. For example, the Mossi household has on average 2 cattle which are used for draught power. Goats are more prevalent than sheep in Mossi households, with, on average, each family owning between seven and 12 goats with only a few families owning one or two sheep. Pigs in Mossi society are linked to the production of dolo, the local beer. The pigs are fed on the discarded fermented red sorghum. In Boutiourou, two families own pigs, one has four pigs and the other three. Donkeys are also kept by the Mossi for draught power, these are often loaned or hired out, with their carts, to other families who need to transport heavy items. Most families own chickens and guinea fowl, with each household on average owning 25 chickens and 20 guinea fowl. The uses of these different animals are constant with the uses in Nuni society, added to these uses an animal may be killed (sheep or goat) if a group of people come to the aid of another to build or to help with the farm work. Women are forbidden to rear animals; it is strictly a male domain.

In table 6.11, two examples are given of the use of animals in two households, again illustrating the range of uses of animals.

Table 6.11 Examples of the revenue and purpose of Mossi animal sales in Boutiourou, 1994

Example one		**Example two**	
I killed 2 pigs for festivals		I killed 2 goats for Ramadam and Tabaski	
I killed two goats this year for my family		I sold 3 goats for 3,500 to 6,000 FCFA each	13,500
I sold 2 goats at 2,500 FCFA each	5,000	I sold 10 chickens for 600 FCFA each	6,000
I sold 23 chickens for 650 FCFA each	14,950	I sold 9 guinea fowl for 650 FCFA each	5,850
I sold 12 guinea fowl for 550 FCFA each	6,600	I sold 450 guinea fowl eggs for about 7500 FCFA	7,500
I sold 170 guinea fowl eggs for about 3,000 FCFA	3,000		
Total	**29,550 FCFA**	**Total**	**32,850 FCFA**

Source: Author's fieldwork, 1994-1995.

These sales contribute a significantly to household income is a relatively higher contribution compared to their Nuni neighbours.

Animals are pastured around the compounds in the rainy season and, in the dry season, they are taken to the valleys bottoms or further afield up to a distance of 3 km. From February to May the animals are fed on stored feed, such as cereal stalks, groundnut shells, sweet potato peelings and cowpea residue. The diet of fowl are improved by bringing them termites from termite hills. A system that shares some characteristics with zero-grazing (i.e. stall feeding animals) is employed for the smallest animals. The Mossi say that the biggest problems with animal rearing are illness and theft of the animals.

6.5.4 Household consumption

The Mossi have two types of granary: thatched, non-treated granaries, similar to the Nuni and granaries which are constructed out of mud brick in a rectangular cube-shape, off the ground on stilts. Stored crops can last in the granary for one to two years, (showing a heightened knowledge of food shortage and the need for food storage) although the food reserves generally only last until the next season. The different crops are stored in different states, with the obvious difference

being millet, which is stored in grains, compared with the Nuni method of storing it on the head. Bambara nuts are stored, mixed with ash, in the thatched granary; cowpeas are stored with chemical treatment in thatched granary; sorghum and maize are stored on the head in mud brick granaries without treatment; millet is stored in grains, with treatment, in mud granaries; groundnuts are stored in thatched granaries without treatment until they are sold in December (when the prices are highest); and finally yams are stored in hangars in the compound until February (again when the prices are highest) and then sold.

Table 6.12 Typical Mossi consumption rates for a range of crops in Boutiourou, in percentage value of total produced

	Maize	Millet	Sorghum	Yam	Sweet potato	Groundnuts	Cowpeas	Cotton
Eaten	78	62	78	20	38	23	45	0
Sold	22	38	22	70	50	60	35	100
Seeds	0	0	0	10	12	17	20	0

Source: Author's fieldwork, 1993 -1995.

There is a difference between the consumption patterns of the Mossi and the Nuni. This is illustrated in the table 6.12. The most noticeable difference is that the Mossi sell some of their cereal harvest, whereas the Nuni conserve all for their own consumption in normal circumstances. With the other crops, it becomes clear that the Mossi sell a higher proportion of their crops than do the Nuni.

It can be seen from table 6.13 that the Mossi of Boutiourou have a highly differentiated food calendar compared with the Mossi of Lon, indicating a greater seasonal food variety. Note the presence of a range of gathered fruit and food crops.

Table 6.13 A typical Mossi food calendar in Boutiourou

Month	Diet
January - February	Sorghum To, cowpeas, sauce from dry ingredients of okra, sorrel and *kapokiér* leaves.
March - April	Millet To, sauce from dry ingredients of okra, sorrel, *kapokiér* and **pelgha** (*Securidaca longepedunculata*) leaves, néré fruit.
May	Millet or sorghum To, cowpeas, bambara nuts, sauce from dry ingredients of okra, sorrel, *kapokiér* and **pelgha** leaves, néré fruit.
June - July	Millet or sorghum To, cowpeas, bambara nuts, sauce from fresh okra, sorrel, niébé leaves, fruit from wild grape, liana and karité.
August	Millet To, cowpeas, maize, bambara nuts, sauce from fresh okra, sorrel, niébé leaves, fruit from wild grape, liana and karité.
September	Maize To, cowpeas, maize, bambara nuts, sauce from fresh okra, sorrel, niébé leaves, fruit from wild grape, liana.
October	Maize To, sweet potato, cowpeas, bambara nuts, sauce from fresh okra, sorrel, niébé leaves.
November	Maize or sorghum To, sweet potato, cowpeas, bambara nuts, sauce from dry okra and sorrel.
December	Sorghum To, cowpeas, bambara nuts, sauce from dry okra and sorrel.

Source: Author's fieldwork, 1994-1995.

6.5.5 Household income and expenditure

The Mossi invest less than the Nuni for agricultural inputs such as fertiliser and seed treatments. The average household only pays 2,500 FCFA for cotton fertiliser and 3,500 FCFA for non-cotton fertiliser each season. Likewise the average household only pays 2,500 FCFA for cotton insecticide and no households purchase non-cotton insecticide. For seed treatment (fungicide), the average Mossi household spends 275 FCFA per agricultural season.

Almost every household hires manual labour each season. Hired work is used for harvesting cotton, field preparation and weeding. Despite the Mossi habit of working in family groups it seems it is necessary each season to hire groups to help with the heavy agricultural work. The hired labour in Boutiourou include; a Mossi group of 27 men (paid 2,500 FCFA per day); a catholic Mossi group of 32 people (paid 3,000 FCFA per day); a small group of six Nuni (paid 500 FCFA per person per day); a Mossi women's group of nine (1,000 FCFA per day); a youth group of four (500 FCFA per day); a group of six Mossi (paid 750 FCFA per day), one Nuni is

paid 500 FCFA per day. Hired labour is very common and there is a range of types of labour to choose from depending on the nature of work required.

Credit is taken in the same fashion as with the Nuni. The majority of the credit is taken through SOFITEX. A common level of expenditure amongst cotton growers is two sacks of NPK at 3,000 FCFA and one 50 kg bag of urea at 1,500 FCFA. Some Mossi take advantage of the phosphate fertilisers provided on credit by the *Gestion de Terroirs* project in Léo. Some other Mossi farmers have taken ploughs on credit with the CRPA payable at 23,000 FCFA per year over 6 years. The Mossi women also take fertiliser (generally for maize) on credit from the *Gestion de Terroirs* programme.

For generating income, the Mossi sell tubers (yam and sweet potato), groundnuts, fowl, eggs, sheep and goats, pigs, mats and cereals. The Mossi sell much of their harvest and are considered more involved with a monetary economy than the Nuni.

Household expenditure includes the repayment of credit, hired labour, travelling, clothes, funerals, medicine and preparing for festivals (with clothes and food). Mossi women, like the Nuni, have separate buying and selling characteristics to the men. Mossi women sell cowpeas, bambara nuts, millet and sorghum (if the harvest has been sufficient), dry okra, karité nuts and dolo. Mossi women, however, sell more agricultural crops and less processed wild food products than the Nuni, they also make and sell dolo, which the Nuni women do not. Mossi women buy clothes, beauty products, medicine, pots and pans. Their biggest expenditure is the same as the Nuni, clothes and pots and pans. Additional money is spent on travelling expenses.

6.5.6 Women's timetables

The following tables give the average daily and yearly activities of the Mossi women in Boutiourou. Compared with the Nuni of Boutiourou the Mossi have a considerably longer time put aside for individual activities. This is partly due to the absence of the preparation of a midday meal in Boutiourou. Normally, farmers will eat cold beans or snack of locally sold or gathered foods. The time for individual activities will be filled with the seasonal activities seen in table 6.15 which are dominated by making and selling dolo and farming.

Table 6.14 A Mossi woman's typical daily timetable in Boutiourou

Time	Activity
6 - 7 am	Fetch water and wash the pots,
7 - 8 am	prepare and eat breakfast,
8 - 10 am	pound millet,
10 -2 p.m.	individual activities or collect wood if there is none,
2 - 4 p.m.	fetch water, pound millet,
4 - 5 p.m.	grind flour for the evening meal,
5 - 6 p.m.	prepare the evening meal and heat water for bathing,
6 - 7 p.m.	eat,
7 - 8 p.m.	wash the pots,
8 -	rest and sleep.

Source: Author's fieldwork, 1994-1995.

Table 6.15 A Mossi woman's typical yearly timetable in Boutiourou

Month	Activity
January - February	Making and selling dolo, fetching water for construction of houses, upkeep of walls and courtyards, collect *kapokiér* fruit and make potash.
March - April	Making and selling dolo, collecting wild fruit (detarium and néré) and tree leaves.
May - June	Making and selling dolo, collecting karité nuts, farm work begins, field clearing (husband's and personal fields) and sowing.
July - August	Collect karité nuts and farm work.
September - October	Harvest.
November - December	Making and selling dolo, drying sauce ingredients.

Source: Author's fieldwork, 1994-1995.

6.5.7 Reaction to the Nuni

The Mossi say on the whole they live in harmony with the Nuni. Their biggest problem they feel is that they have to farm the same piece of land continually. The Mossi think that the Nuni's agricultural system is good because of their soil and water conservation techniques and the manner in which they strengthen the crops against the wind (*buttage*). The Mossi to a large extent have started mimicking the way in which the Nuni do this, although, like the Nuni, the

Mossi are not completely happy with the situation on their land. They feel they do not get a big enough harvest.

6.6 The Fulani of Boutiourou

6.6.1 First arrivals

The first Fulani of Boutiourou arrived 17 years ago from the province of Passoré, and the next families arrived 10 years ago from Oubritenga. They approached the Land Chief for land which was accordingly given to them. The Fulani head of household in Boutiourou has three wives and an average of eight children; five boys and three girls. But the Fulani loose a higher number of children with an average of three boys and two girls being lost to illness and death. The Fulani women say that family deaths usually occur in the dry season and births in the rainy season. The number of people in a Fulani household varies with the families having been here the longest having the largest families and *vice versa*. Family sizes range from nine to 28.

6.6.2 The Fulani production system

Farm work is carried out by the household unit, although the women only help with the harvest. The average Fulani field size is 2.25 hectares and these fields are situated immediately around their encampments. The cropping duration on one parcel of land varies from three to 13 years. Fallows are left for only one to three years. These long cropping periods and short fallows exist because of the integration of the cattle and their manure with the farming system. The fallows are used for cattle corrals and cattle grazing. Also in the dry season, cattle are grazed and placed in corrals on the fields that will be used in the proceeding season. When preparing the fields the Fulani, like the two other tribes, selectively cut the trees in their fields. They leave the wild fruit trees including the néré and the karité, also the liana and, unlike the Nuni and Mossi, they leave fodder trees. They do not burn the bush because it destroys valuable pasture. The Fulani leave a significant number of trees in the areas they farm which is comparable to the number left by the Nuni. The Fulani say that the farming methods have not changed except for the use of seed treatment chemicals, on which the average household spends 500 FCFA. They do not buy any form of fertiliser or insecticide.

Their cattle are taken to graze in the rainy season up to a distance of 3 km. In the dry season, the distance increases to 7 km. In the dry season much use is made of fodder trees when the cattle are at a water point or have stopped to graze. The herder will climb the tree and cut branches for his animals waiting below.

Table 6.16 shows the Fulani of Boutiourou's agricultural timetable and how it is dominated by subsistence cereal cultivation.

Table 6.16 A typical Fulani agricultural timetable in Boutiourou

Month	**Activity**
January - April	Animal herding.
May	Field preparation.
June	First and second sowing of sorghum, millet and maize.
July - August	Weeding and upkeep of crops.
September	Harvest maize.
October	Harvest sorghum and millet.
November - December	Prepare next season's fields by bringing cattle onto the site.

Source: Author's fieldwork, 1993-1995.

The Fulani in Boutiourou do not belong to any village group. They work in family groups to carry out agricultural or herding work or when the time comes for vaccinating the cattle. The women work in groups of two to eight when they harvest and pound the millet together. The women also gather a range products, often in groups, from the bush; these include, tamarind fruit, detarium fruit, liana, fruit from *L.microcarpa*, and karité nuts.

The biggest non-agricultural work is the task of mat weaving, which are used to make the Fulani houses. Mats are also sold on the market. Both women and men weave the mats and Fulani women will pay men to go and collect the straw for them (from the grasses **gnadman** and **penicetum**).

6.6.3 Animal husbandry

The Fulani herd size is on average made up of: between 30 and 60 cattle (usually a mixture of Zebu and N'Dama cattle); 10 sheep; 10 goats; 15 chickens; and 20 guinea fowl. The prices for these are as follows: cattle vary between 25,000 to 75,000 FCFA depending on size, age, sex and condition. Cattle are sold to pay mainly for cereals around the 'hungry season', in addition to this if there is a need of between 10,000 to 15,000 FCFA then the household will sell a cow; goats and sheep sell from 4,000 to 5,000 FCFA and are sold for social reasons, e.g. visits, gifts, religious occasions or urgent problems; chickens and guinea fowl sell from between 700 to 1,000 FCFA, and are used to supplement household diet or for satisfying small needs, e.g. for buying cola nuts[20], tobacco or soap. Below are examples of animal sales by two Fulani households and the considerable revenue that are generated from their sale..

Table 6.17 Examples of the revenue and purpose of Fulani animal sales in Boutiourou, 1994

Example one	Example two
I sold: 4 cattle, two for 30,000 FCFA and two for 45,000 FCFA, to pay for animal vaccinations, cereals and medicine; 2 sheep for 5,000 FCFA each to pay for family visits, animal feed (salt tablets) and money for presents. I killed 3 goats for the festivals. **Total: 160,000 FCFA**	I sold: 10 cattle, two for 20,000, five for 35,000 and three for 40,000 to pay for vaccinations, food and medicine. I keep the fowl for myself. **Total: 335,000 FCFA**

Source: Author's fieldwork, 1994-1995.

Women have started to rear their own animals, this they say has been necessitated by economic pressures. One Fulani woman has four goats and ten chickens of her own. In 1994/95 she sold one goat for 4,000 FCFA and another for 5,000 FCFA to buy medicine. In the same year she sold six chickens at 500 FCFA for the chickens and 700 FCFA for the cocks, to buy food and clothes.

The reproduction rates in Boutiourou are the same as for those of Lon.

[20] See glossary in appendix 1.

Table 6.18 Reproduction rates of the different animals in Boutiourou

Animal	Reproduction rate
Cattle	One calf every one or two years depending on diet and climate. Depending on the size of the herd, each year can see an increase of between 10 and 20 calves.
Sheep and Goats	Twice per year giving birth to an average of two kids/lambs. This gives an increase of between 20 and 30 per year.
Chickens and guinea fowl	These lay three to five times per year producing 9 to 13 chicks each time. Egg production can be anything from 400 to 1,000 per year, and depending on need the eggs will be allowed to be incubated, on average to produce 50 new fowl per year. The rest of the eggs are usually sold or given as gifts.

Source: Author's fieldwork, 1994.

6.6.4 Household consumption

The Fulani grow only cereals and these are stored in thatched granaries (which are not lined with mud like the Nuni and the Mossi) and do not use any storage treatments on the crops stored because of the relatively short time the cereals are stored. The stored food will last until June or July, after that animals are sold (on average 5 or 6 cattle per year) to pay for their cereal needs until the next harvest. In the past milk could be exchange for cereals but this is no longer possible "because of over-population" (words of a Fulani elder). The Fulani of Boutiourou consume all they produce (see table 6.19).

Table 6.19 Typical Fulani consumption rates for a range of crops in Boutiourou, in percentage value of total produced

	Sorghum	Millet	Maize
Eaten	100	100	100
Sold	0	0	0
Seeds	0	0	0

Source: Author's fieldwork, 1993-1995.

Table 6.20 shows the Fulani eating habits. Milk is present in the diet for eight months of the year which is slightly longer than in Lon. Gathered leaves also provide an important part of the sauce ingredient needs in the year.

Table 6.20 A typical Fulani food calendar in Boutiourou

Month	Diet
January - February	Millet To, rarely milk, sauce made from dry ingredients of okra and sorrel, *kapokiér* and baobab leaves, **ganka** (*D.mespiliformis*) and detarium fruits.
March - April	Sorghum To, very rarely milk, sauce made from dry ingredients of okra and sorrel, *kapokiér* and baobab leaves, néré fruit.
May - June	Maize or sorghum To, milk is added to food, fresh sorrel, baobab and niébé leaves for sauce and karité fruit.
July - August	Maize or millet To, milk, fresh sorrel, baobab and niébé leaves for sauce.
September - October	Maize or sorghum To, milk, fresh sorrel, baobab and niébé leaves for sauce.
November - December	Millet or sorghum To, milk, sauce made from dry ingredients of *kapokiér* and sorrel.

Source: Author's fieldwork, 1994-1995.

The Fulani say that their eating patterns have changed from their original homes in the north of Burkina. In Sissili, they say that milk is no longer a regular part of their diet and they say that they are starting to eat tubers which they never used to. Meat is eaten once in every one to three weeks.

6.6.5 Household income and expenditure

Fulani often hire labour to prepare, and harvest their fields and/or shepherds to herd their animals. Payments for hired labour (usually Nuni or Mossi) can range from 15,000 to 75,000 FCFA per year.

The Fulani sell approximately seven to 10 percent of their cattle herd per season, three percent of their sheep and goats and 50 percent of their fowl. The cattle are usually sold to travelling traders who come to find the Fulani in the bush, although cattle are occasionally taken to Léo to be sold. It is more usual for the fowl, goats or sheep to be taken to market but the are also often sold in or

between villages. It is unusual for a Fulani to take credit. The biggest expenditure in a normal year is on veterinary bills, food and visits to their parents.

The Fulani women are the ones solely in charge of extracting, preparing and selling the milk at the market and around villages. They also sell karité nuts which they have collected in the bush. The place of sale is predominantly around their own encampments (i.e. people will come to them), or in the small village markets. Women will rarely come to Léo, except on special occasions, e.g. to buy clothes, and tend to purchase items in the small village markets. The Fulani women will buy calabasses, medicine, clothes and sauce ingredients, with the latter two items being the biggest expenditures.

The Fulani of Boutiourou feel that the devaluation has severely affected them ("*we have more money but it is worth less*") because it has doubled the prices of the veterinary bills (because veterinary products are imported from Europe). They also feel that money, in the past, was more difficult to get but things (animals) had more worth and value. They said that money is easy to get today because everything is commercial, but the money is worth less.

6.6.6 Women's timetables

The Fulani women also have a proportionally longer period for individual activities compared to the Nuni. Also, similar to the Fulani of Lon, much of their day is devoted to the treatment and preparation of milk products.

Table 6.21 A Fulani woman's typical daily timetable in Boutiourou

Time	Activity
6 - 8 am	Heat water for washing, treat milk and prepare breakfast,
8 -9 am	fetch water,
9 - 10 am	wash dishes, pound millet,
10 - 11 am	collect wood, (if they have none),
11 - 1 p.m.	prepare the midday meal,
1 - 3 p.m.	rest or individual activities,
3 - 4 p.m.	pound flour for evening meal,
4 - 6 p.m.	fetch water, treat milk, prepare evening meal,
6 - 7 p.m.	eat food,
7 - 8 p.m.	wash dishes, prepare for sleep.

Source: Author's fieldwork, 1994-1995.

The Fulani woman's yearly activities are also dominated by milk treatment and to a lesser extent karité nut collection.

Table 6.22 A Fulani woman's typical yearly timetable in Boutiourou

Month	Activity
January - April	Collect wood that is used to make potash, selling milk.
May - August	Selling milk, collect karité nuts.
September - December	Selling milk and karité nuts, help with the harvest.

Source: Author's fieldwork, 1994-1995.

6.6.7 Reaction to the Nuni

The Fulani say they have a good relationship with the Nuni in Boutiourou. They say they came here on foot, following their herds when the pasture became too short in the north and the Nuni allowed them to stay. They say that the Nuni are specialists in the way they farm and that the Fulani have their own way.

6.7 Ethnic interrelationships

The level of cross-ethnic contact is, similar to Lon, very strong and each production system seems to complement the others. There is however a big difference in the spatial arrangements which reflects both a different approach to land management in the territories and also the duration of the immigrants.

Table 6.23 Ethnic interrelationships in Boutiourou

Direction of transfer	Activities
Fulani ⟶ Mossi	• Sale of milk and meat. • Cattle guarding. • Dung. • Veterinary advice. • Sale of animals. • Grazing animals in post-harvest fields.
Mossi ⟶ Fulani	• Labour. • Sale of cereals, foodstuffs, tools, etc. • Dolo.
Fulani ⟷ Mossi	• Demonstrations of animal traction, veterinary issues, vaccinations, etc, with extension agent. • Participation in village meetings.
Fulani ⟶ Nuni	• Cattle guarding. • Sale of milk and meat. • Dung. • Gifts.
Nuni ⟶ Fulani	• Labour. • Sale of foodstuffs. • Administrative control. • Land.
Fulani ⟷ Nuni	• Some participation in meetings, more listening that voting or discussing. • Participation in religious festivals and celebrations. • Some skill sharing. • Demonstrations of animal traction, veterinary issues, vaccinations, etc, with extension agent.
Nuni ⟶ Mossi	• Wives. • Labour. • Administrative control. • Medicinal advice. • Land. • Sale of cereals, foodstuffs, tools, etc.
Mossi ⟶ Nuni	• Labour. • Gifts. • Sale of cereals, foodstuffs, some hardwares, etc. • Dolo.
Nuni ⟷ Mossi	• Skill sharing. • Labour exchange/sharing. • Equal participation in mens' and womens' agricultural groups. • Knowledge exchange. • Religious ceremonies. • Transport. • Trade. • Participation in decision making concerning, the use of currently (or about to be) used land e.g. land around the dam, and the division and rationing of tasks, e.g. on the construction of the dam.

Source: Author's fieldwork, 1993-1995.

The Nuni and Mossi communities have not merged together to the same extent as Lon, because of the separation of their living spaces. At Lon, the Nuni and Mossi are literally

neighbours, in Boutiourou, there is a spatial distance between cantons. There is also less intermarriage between Nuni and Mossi, possibly because there still remains distinct groups with distinct identities. However, despite this physical separation, there is a strong solidarity and cohesion between the Nuni and Mossi.

The village of Boutiourou has a more 'robust' production system than Lon which is due to a number of factors. A more abundant ecology, a strong cohesion and good leadership from the traditional chiefs and a proximity to urban supply centres. Ethnic exchange entitlements are strong and seem to be improving with time. New production techniques (e.g. cotton) have strengthened the farming system and the 'learning from each other' seems to complement each separate farming system.

7. VILLAGE CASE STUDY THREE: SABOUE

Chapter overview

Chapter seven presents the final village case study of Saboué. Saboué is the smallest village and is located on the southern edge of Sissili, on the Ghanaian border. The chapter is ordered in the same format as in chapters five and six.

7.1 Saboué

7.1.1 Introduction

Saboué's territory has an area of approximately 37 km^2 and shares borders with Bétiassan to the west, Yelbouga to the northwest, Pissié to the north and Biéha to the east. It is the smallest of the three case study villages. In 1985 it had a population of 266, at which time, the majority of the immigrants had already settled. The population is thought by the elders not to have altered significantly in the interim period. It has five cantons, three Nuni, one Mossi and one Fulani.

The village of Saboué is an off-shoot of the village of Pissié as can be seen in the oral history of Saboué (see box 7.1); Saboué began as a neighbourhood (albeit approximately three kilometres away) of Pissié but has now been given village status. It has significant family links and there are numerous Pissié fields in the territory of Saboué. The population of Saboué consider the people of Pissié to be their 'brothers' and will often celebrate feasts or bury their dead in Pissié. Problems may also be resolved in Pissié. As time progresses however, Saboué gains more and more autonomy.

The landscape of Saboué is basically the same as the landscape of Boutiourou, as most villages in Sissili occupy the same position on the landscape. The natural vegetation in Saboué

is more diverse than the other two villages and there is generally less evidence of a significant human impact relative to Lon and Boutiourou, i.e. there is more 'natural bush'. Saboué also has a higher number of streams and more lower slope surface area and, consequently, a more fertile land area.

7.1.2 Population

With the smallest population of the case-study villages, there is still a Nuni majority. Also unusually, there is a higher proportion of Fulani than there is Mossi, reflecting the quality of the bush for pasture, the proximity of Saboué to Ghana (for trade in cattle) and its relative isolation from major markets. (Mossi prefer areas around the centre axis of Sissili which gives them the best access to the markets of Léo, Tô, and further north, Koudougou and Ougadougou and a greater access to other Mossi communities). However, Biéha holds a weekly market on Wednesdays which attracts a relatively high number of traders, though it is small in comparison to the Sunday market in Léo.

Box 7.1 The oral history of Saboué

The village of Saboué means 'the bush that has been transformed' and is said to be approximately 200 years old. The first family arrived from the village of Pissié because there was no longer any land for them to farm in the village. Necourou Nacro left his brothers in Pissié and took his animal herd to find pasture. Necourou found a valley bottom where water was plentiful and he drank from the stream using the bark from a baobab tree. The pasture was good and the soil was rich and so he set up camp. After staying there for a while, he returned to Pissié to find his brothers to tell them of the place he had found. He convinced his brothers that the valley bottom he had found would be a good place to settle and farm because of its fertility. His brothers returned with Necourou to help him farm and the village developed and grew from their family. The Nacro family is both the Land Chief and the Village Chief.

Source: Author's fieldwork, 1994.

There are five recognised cantons: three Nuni cantons, one Mossi and one Fulani. There are four Mossi families and six Fulani families. The Fulani arrived 15 years ago, and now live to the northwest of the village, and the Mossi came 10 years ago and live to the south of Saboué's territory. The immigrants left their homes in the north because of the drought conditions and the impoverishment of resources; "*but we feel that the same conditions will follow us, already there are signs, like the streams drying up before the start of the rainy season*".

Table 7.1 The cantons of Saboué, 1995

Canton name	Name of canton chief	Position
Bayasan	Nacro, Issouf (N)	Village and Land Chief
Kambouiliasanou	Nacro, Boureima (N)	Head of family
Nebiésan	Nébié, Drissa (N)	Village counsellor
Mossi	Ouedraogo, Kouka (M)	Mossi chief
Peulh	Barry, Issa (F)	Fulani chief

(N - Nuni, M - Mossi, F - Fulani)

Source: Author's fieldwork, 1993-1995.

7.1.3 Description of the landscape

The transect of Saboué (figure 7.1) shows two sides to the landscape; one which has been largely untouched by human activity and retains a high species diversity, and the other which has been significantly altered by human activity. Starting from the left of the valley bottom the natural quality of the riverine natural vegetation in southeastern Sissili becomes evident; a high species diversity and density that has remained largely unaltered by human activity. These are the gathering zones that have not been exploited for dry season gardening, paddies or significant pasture. This type of vegetation follows the numerous watercourses throughout Saboué's territory and as such gives Saboué one of the most dense natural vegetation patterns in Sissili.

The stream bed is completely treeless and supports only grasses, which are used for weaving, thatching and dry season pasture. Next to this there are the remnants of the riverine woodland that is found to the left, this area has been previously farmed but is now fallow. There still

remains a high species count (16 species) although not as high as the woodland on the other bank (22 species). Next to this section there is a heavily exploited area which is currently fallow and is showing signs of erosion. This is one of the central exploitation zones of the village and has been periodically farmed since the village was created, making up the village field zone. This area is also fallow at present with only eight tree species and is dominated by the néré which has been encouraged in the Nuni fields. The adjoining area makes up the Nuni zone of habitation and the household fields. Here, there is the first sign of exotic tree species by the resident Nuni. These include the lime, papaya and mango. It should be noted that the number and range of planted species in Saboué compared to the other villages is a lot less due to Saboué's relative isolation and the consequent inaccessibility of tree seedlings. The trees that have been preserved around the habitation zone all have important uses, see below,

F.platyphylla	A shade tree, meeting place, a place of counsel and medicine.
A.digitata	Baobab, used for food, medicine, rope making, honey and religious uses (the elders are buried underneath the tree's canopy).
Citris spp.	Fruit, medicine.
D.mespiliformis	Fruit, medicine and fuel.
P.biglobosa	Fruit, medicine food and money (from the sale of seeds and **soumbala**).
M.indica	Fruit, medicine.
C.papaye	Fruit, medicine.
Combretum spp.	Various medicinal and food uses.
B.aegyptiaca	Fruit and food.
L.microcarpa	Fruit, medicine.
Euphorbia spp.	Fencing, medicine.

Here small household fields exist, kept under permanent cultivation through the application of household waste and compost.

To the right of the habitation zone there are the village fields which are presently fallow and are in the process of regeneration, seen by the presence of young trees. The results of long term cultivation can be seen to the far right of the transect where the number of species has diminished to seven, but still there are a significant number of néré and karité trees. It should be noted that the karité trees are found further away from the habitation zone and they are less likely to be found in the farmed area. They are more likely to be found in regenerating fallows or in the bush due to their dislike of disturbance or injury, conditions which are tolerated by the néré.

Figure 7.1 Village transect, 1993-1995

Trees and Shrubs	Butyrospernum parkii Parkia biglobosa Diospyros mespiliformis Terminalia macroptera Vitex doniana Combretum spp Crosopteryx febrifuga Detarium microcarpa Lannea microcarpa Khaya senegalensis Landolphea spp Entada africana Annona senegalensis Sterculia setigera Bombax spp Afzelia africana Cassia sieberiana Pterocarpus spp Gardenia erubesens Dichrostachys cinera Lannea spp Erythrina senegelensis		Mitragyna inermis Pterocarpus spp Combretum spp Lannea acida Lannea microcarpa Piliostigma reticulatum Parkia biglobosa Butyrospernum parkii Diospyros mespiliformis Landolphea spp Ficus spp Dichrostachys cinera Vitex doniana Detarium microcarpa	Parkia biglobosa Bombax spp Diospyros mespiliformis Landolphea spp Pterocarpus spp Vitex doniana Detarium microcarpa Combretum spp	Ficus platyphylla Adansonia digitata Citris spp Diospyros mespiliformis Parkia biglobosa Mangifera indica Carica papaye Combretum spp Balanites aegyptica Lannea microcarpa Euphorbia spp	Parkia biglobosa Butyrospernum parkii Pterocarpus spp Piliostigma reticulatum (s) Combretum spp (s) Vitex doniana (s) Detarium microcarpa (s) Cassia siberiana (s) Adansonia digitata Lannea spp (s)	Butyrospernum parkii Parkia biglobosa Adansonia digitata Piliostigma spp (s) Combretum spp (s) Lannea spp (s) Crosopteryx febrifuga
Remarks		Stream valley No trees Sandy soil	Fallow, black soil	Fallow with signs of erosion, concrete well	Household fields, main habitation zone, cemetery	Fallow, poorer soil (s) signifies small trees in process of regeneration	Fallow, poorer soil

Source: Author's fieldwork, 1994

These areas of village fallow have been left to recover and the farmers have moved slightly away from the habitation zone to the east.

7.1.4 Evolution of the farmed area

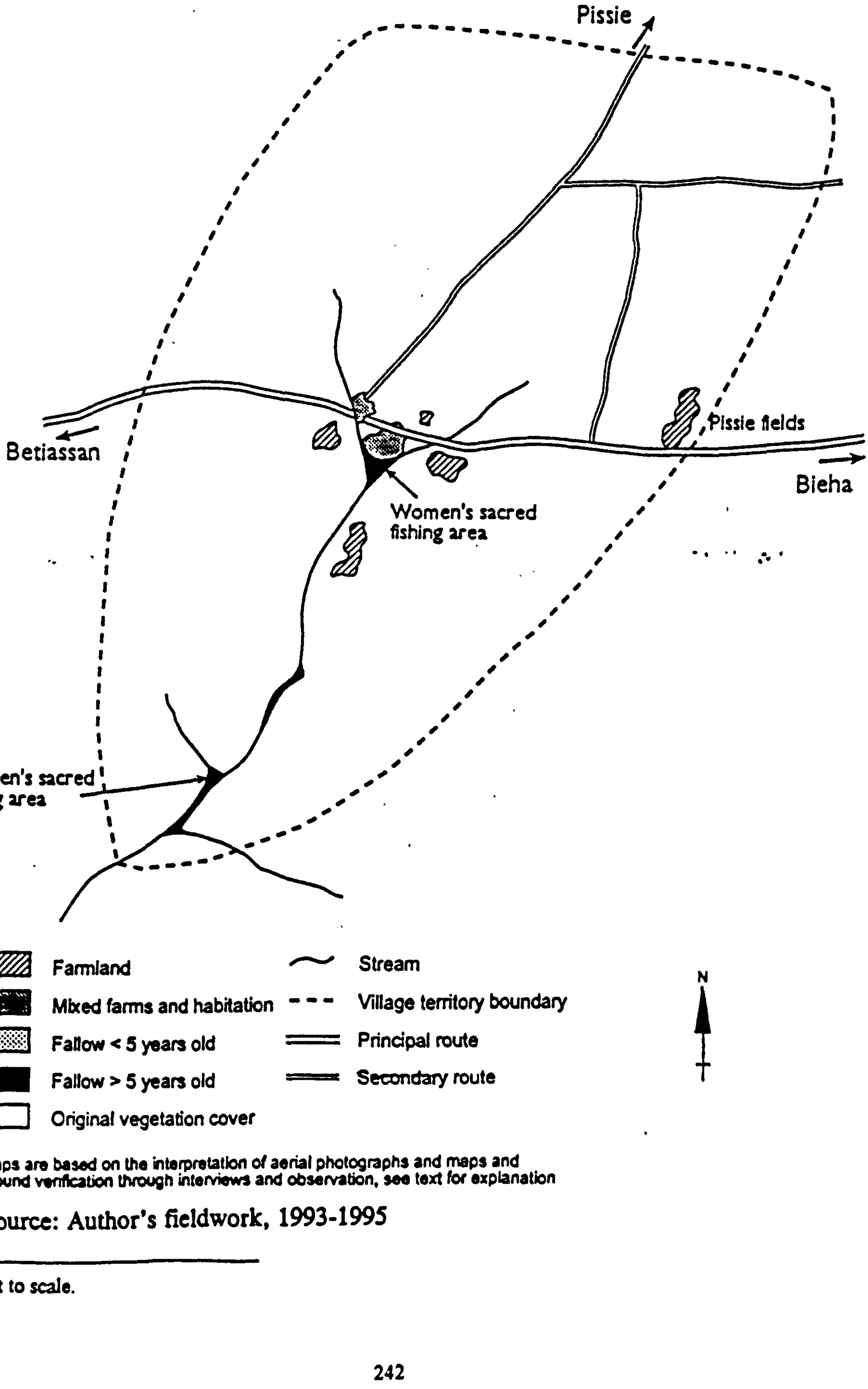
As has already been mentioned, the territory of Saboué began as an extension of the territory of Pissié to the north east of Saboué. Because of this the northern boundary of Saboué is an area of tenurial insecurity where it attaches to the territory of Pissié. In the past this has never been a problem because of the ample space available for the small population of the area, however, as space becomes a problem there are the beginnings of encroachment into the north of Saboué's territory by Pissié farmers.

In 1955, there was a minimal human population, numbering only a handful of families. The area was in dense bush, much of the southern area covered by dense riverine bush seen in part of the transect, and the northern area would have been covered by almost continuous savanna woodland. The village was situated in the middle of two streams that passed either side of the houses and a sacred fishing area was found to the south. The four fields of the original Nuni were situated on the lower slopes and there was one field belonging to a family of Pissié to the far east.

In 1983, there has been an expansion of the farmed area and an introduction of the Mossi and the Fulani. The Fulani have settled to the west in one camp made up of several families (where the bush is at its most dense), and the Mossi have settled to the southeast. The Nuni fields have moved outwards slightly towards the periphery with their old fields lying fallow. Also, there has been the start of exploitation of the northern area by the Nuni in what has become to be recognised as the cereal growing zone, with the southern area being the tuber growing zone. The Pissié field to the east has remained in place although slightly changing orientation and there is the beginning of exploitation in the north by two Pissié families.

Figure 7.2 The evolution of the landscape in Saboué, 1955 to 1993[1].

A. 1955

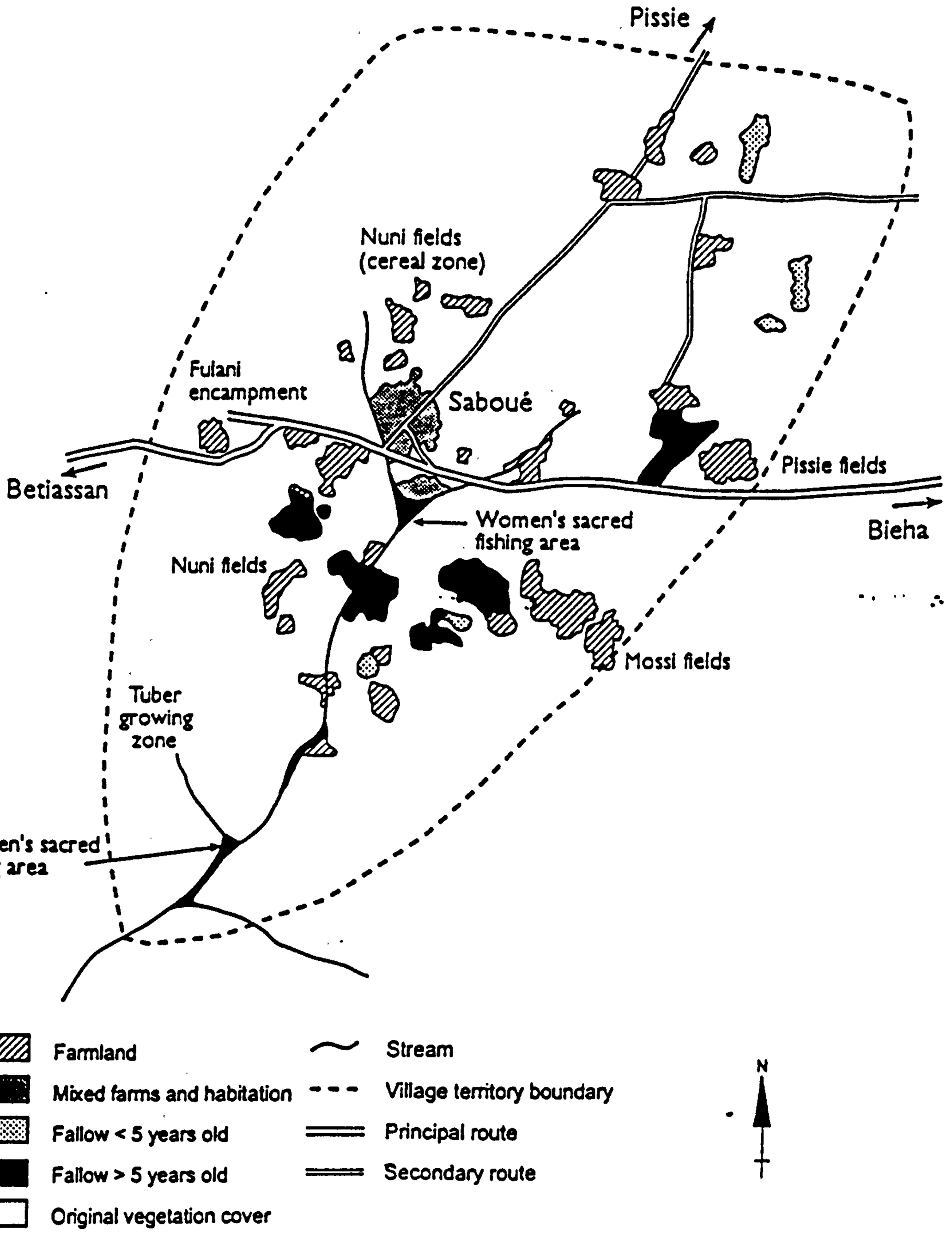


Maps are based on the interpretation of aerial photographs and maps and ground verification through interviews and observation, see text for explanation

Source: Author's fieldwork, 1993-1995

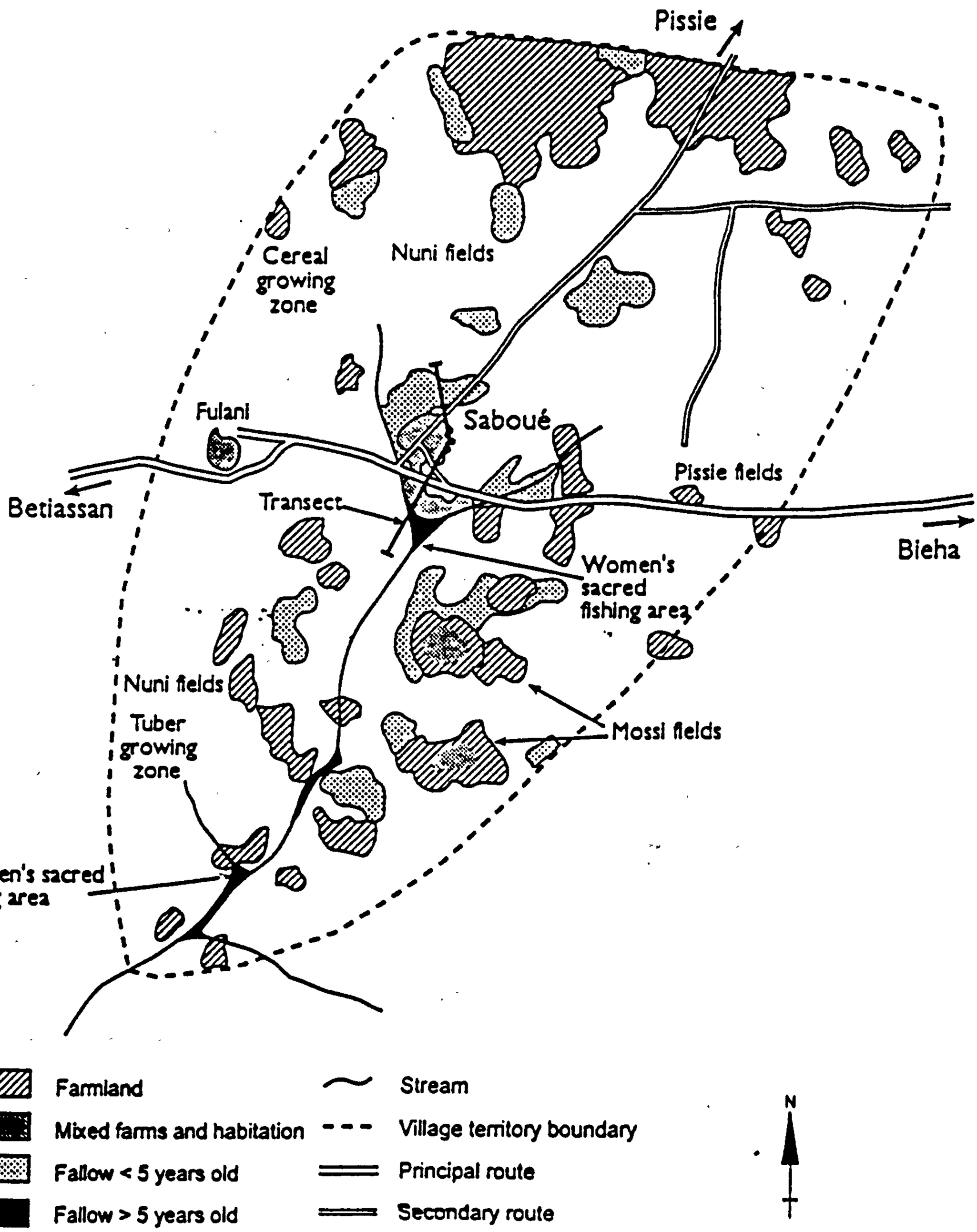
[1] Not to scale.

B.1983



Maps are based on the interpretation of aerial photographs and maps and ground verification through interviews and observation, see text for explanation

C. 1993



Maps are based on the interpretation of aerial photographs and maps and ground verification through interviews and observation, see text for explanation

There has been no significant influx of immigrants since the first arrived around 15 years ago which makes Saboué a case in particular. The villages of Lon and Boutiourou have continued to receive immigrants up to five years ago. The Nuni of Saboué are also unique because they are a breakaway faction of the Pissié families and as such have a very close relationship, culturally, socially and physically.

In 1993, there has been further expansion of the cultivated area, most notably in the northern area where the Pissié farmers have increased their range. The Mossi remain confined to the southeast, with a slight expansion of their farmed area and a movement inwards towards the stream, in virgin bushland. The Nuni have moved their bush fields further south into the tuber growing zone, perhaps as the need for more cash crops arises. The Nuni have also opened up some farms, in the north northwest and the north northeast to supervise the expansion of the Pissié farmed area. The Nuni's sacred fishing sites have also remained, although there is now cultivation on the lower slopes around the sacred area in the south. The Fulani remain in the relative isolation of the east, on the road to Betiassan. This may be a conscious decision by the Nuni chief to discourage any expansion of the farmed area in that region.

7.1.5 The future of the occupation of space in Saboué

Saboué has the lowest proportion of farmland in its territory compared with the other two villages and has the lowest population. The village still has over 80 percent of natural woodland cover in its territory (and is also located in a department which has one of the lowest populations and highest percentage woodland cover). Saboué, like Boutiourou, experienced the largest expansion of farmland from 1983 to 1993 which again shows the lateness of arrival by the Mossi immigrants as they travelled past the densely populated northern and central areas of Sissili.

Table 7.2 The growth in the different categories of land cover in Saboué, 1955-1993 [2]

Total land area - 3731 hectares

	1955 ha	% of area	1983 ha	% of area	1993 ha	% of area
Farmland	53	1.4	188	5	465	13
Woodland	3678	98.6	3442	92.4	3099	82.5
Fallow <5 years	-	-	32	0.8	167	4.5
Fallow >5 years	-	-	69	1.8	-	-
Total	3731	100	3731	100	3731	100

7.2 The production and tenure system

7.2.1 Background

The Village Chief (who also acts as the Land Chief) gives out the land to the applicants, with those asking for land having to offer a symbolic gift of one chicken to bless the field. Animals and land gets passed down the male line but, as in all Nuni land, the chief can withdraw usufruct rights if there is justification (although this rarely happens).

Saboué has various other village's fields in its territory. Yelbouga has three fields to the north west in Saboué's territory, and Pissié have seven fields to the north and east of the territory. A family from Yelbouga came a number of years ago with offerings of a chicken and some cola nuts to ask for some land which they were given. The people from Pissié did not have to approach the Village Chief because they are considered as coming from the same family, and, because Saboué was an offshoot from Pissié, it remains under the political control of the Pissié village and Land Chief's in principal. It is suspected however that if a conflict of power arises then Saboué will assert its total independence, although this is extremely unlikely.

Saboué does not have any fields outside of its own territory. The Nuni elders recognise the following soils in their territory. None of the soils recognised are unique to Saboué as they are found in the other villages.

[2] Based on the interpretation of the diagrams of the evolution of the occupation of space.

Table 7.3 The range of soils in Saboué and their Nuni names[3]

Name of soil	Description
Diga	"Soil on the hills, very poor, grasses and trees".
Dudulutia	"One doesn't find trees here that you can find in other places, undergrowth is stunted, small and limited".
Kapafounoutia	"Gravely soil, found near hills, with few trees and undergrowth".
Kasuloutia	"Very sandy soil, few trees and grasses, soil becomes quickly infertile".
Tagatia	"A soil ideal for tuber production".
Tezonou	"Soil found around the houses"
Varatia	"A hard argillic soil, found in the valley bottom".

Source: Author's fieldwork, 1993-1995.

Nuni agriculture is practised to the southwest on **tagatia** soils and on **varatia** and **poontia** areas. The **daba** is the main agricultural tool, with only a handful of people using ox-drawn ploughs. The Nuni say that they now use modern agricultural techniques and are becoming increasingly commercial in their enterprises.

Animals are kept around the houses in the rainy season and taken to pasture in the dry season. When the animals are kept around the houses a large part of their diet, especially sheep and goats, consists of household waste. Generally the children of the household have the responsibility of guarding the animals when they have to be taken short distances for pasture (up to four kilometres). However, the Fulani take charge of the cattle in the dry season when shepherding becomes more intensive. The Nuni say that keeping animals has changed; "*in the past we used to keep animals a long time, now we practice a modern system with vaccinations and it is more expensive. Some people are scared to keep animals because of the cost and threat of theft; the Nuni do not keep many cattle*".

Dry season gardening (which is normally exclusively a women's activity) has been practised in the village for many years on a rudimentary level. It is only from 1994, and with support from ADESSI, that their system of gardening has been improved. Before the intervention of ADESSI, gardening was carried out on semi-cleared land near the stream in the valley bottom and was partly surrounded by woven grass mats as protection against wandering animals. This system produced some vegetables but was prone to insect attack (especially when the

[3] All the soil descriptions are essentially straight translations from the words of the Nuni elders.

vegetables were in their seedling stage) and sometimes stray animals would break through the fencing. Now a site has been cleared, metal fencing surrounds the half hectare site and a well has been sunk in the middle of the site providing water all year round. The women's group grow sorrel, okra, niébé, tomato, local aubergine, lettuce, cabbage and the have a tree nursery growing fruit trees and eucalyptus. They use watering cans, wheel barrows and **dabas** and receive technical assistance from extension workers from both ADESSI and the SPA.

Unlike Lon and Boutiourou, the men of Saboué still hunt. Saboué is situated in relatively dense bush and is very close to Nazinga game park to the northeast. The men of the village use dogs after the harvest to hunt wild guinea fowl, monkey, partridge, hare, deer and wild boar. Although there is still hunting that takes place the men say that "*most of the game has fled to Nazinga park*" which is hardly surprising.

7.2.2 Village organisation

The Nuni canton is relatively small and only has one men's group and one women's group. Their small size and close family relations allows them a deep understanding of the group dynamic and makes it unlikely that conflicts will cause disruptions. The women's group undertake more activities together and come together more often than the men's group. The men's group have an experimental field and have a group woodlot. The women's group have a dry season garden, and a collective field. They also hire themselves as labour, collect karité nuts together and collect water as a group. They also come together to receive technical training.

The Nuni also help each other in births, funerals, building and some farm work. Although these activities are not included in the 'formal' activities of the group, they are carried out in the duties of 'the economy of affection' as subsistence assurance.

The Mossi and Fulani do not have a formal group but they come together in times of need; to build, help with the harvest or animals, and in funerals and births.

7.2.3 Support organisations in the village

Because of its isolation, Saboué has received little support from external organisations. In the recent past (since 1993) Saboué has seen the arrival of *Sixiéme* FED's *Volet Hydraulique* that sunk a pastoral well for the local resident's animals (especially benefiting the Fulani). In the same year ADESSI's PDIPF identified the women's group as in need of support. One of the conditions of support of ADESSI is that the target group does not receive support from other external agencies. ADESSI supported the women's dry season garden. The Government's SPA has an extension worker based in Biéha who visits the village once a fortnight to give agricultural advice to whichever group requests it.

7.2.4 Village resources and infrastructure

The village has two large diameter wells; one that was installed in 1980 by an unknown or forgotten NGO and one by ADESSI in 1994. There is also a water pump in the village that was installed in 1988 by the Government which currently is in disrepair. In addition to this modern infrastructure, there are a multitude of traditional wells scattered about the village. There is no mosque, school or village savings bank. The nearest Mosque is at Pissié and the nearest school is at Biéha, approximately 4 km away.

The village has four Nuni masons, one Nuni mechanic and one Nuni chairmaker.

7.2.5 Changing times

The Mossi started to arrive in the 1980s and this was synonymous with when conditions in the village began to change. Before this the Nuni remember a meningitis epidemic about 100 years ago that killed many people and the tribal wars, and most recently the poor rains of 1990. The Nuni elders say that the increase in the size of the village is a good thing, although they worry that the reasons the immigrants left their homes may eventually come to pass in Saboué (they say the solution for this is to find other ways of farming). They also say that they must travel a long way now to farm and there are water shortages. Other problems that

the Nuni experience are animals destroying crops and the forest is becoming degraded and a shortage of game.

Islam arrived with the Mossi immigrants in the 1980s and the people of Saboué became Muslims because everybody else was becoming a Muslim. The elders say that when the chief of Biéha (the departmental capital) became converted to Islam, he himself commanded the other chiefs in the area to do the same. This is one elder's account of Animism:

> *"Before we seeded the fields we used to celebrate and worship idols, we would sacrifice a chicken and a goat before the idol. Before eating the new harvest the family head would pray before the idol. If the rains did not come we would offer a sacrifice and before we entered our houses it would start to rain! We prayed for a good forest harvest and made sacrifices, we respected the bush and gave thanks for the harvest before bringing it in the house. We also played drums and drank dolo."*

One elder thought that the disappearance of Animism brought the immigrants because with Animism there were parts of the bush where an individual was forbidden to go, either to farm or to graze your animals, "*now, it is permitted to go anywhere*". Another elder said that the loss of Animism has had no effect because now they simply pray in a different manner. There is a feeling that they have more freedom, less rules and the individual can do as s/he pleases. On a more critical note it is also thought that before the advent of Islam the soil was more fertile and the harvests more bountiful, "*today we start eating the food before we have brought it into the house and in the past the rich used to help the poor which no longer happens*".

There are, however, some Animist practices that remain. For example it is forbidden to steal or have sexual relations in the bush. Also, before fishing in the streams a chicken sacrifice must be made which is done to calm the water spirits; one elder recounts the experience, "*when one approaches the stream a snake will appear, when the chicken is sacrificed the snake will return from whence it came and it is then okay to fish*". Another custom concerns firewood that must not be collected from underneath the big baobab tree in the village centre as it is a sacred site.

7.2.6 Village conflicts

To date there has not been any major conflicts in village affairs. The most common conflict is that of another person's animals straying onto fields and damaging the crops. This may be Nuni, Mossi or Fulani, but in all cases they are usually resolved amicably. The village is very cohesive and is small enough for most members of the village to air their views and problems.

7.2.7 Seasonal migration

Like the other villages, there is a seasonal migration to Ghana, Côte D'Ivoire and the larger towns in Burkina Faso, that usually occurs in the dry season. Usually the Nuni go to Ghana to find seasonal paid work or simply to travel, because, as one elder put it "*..de fois tu ne te sent pas au village*[4]". The Fulani also migrate with their cattle to sell them in Ghana or Côte D'Ivoire, and the Mossi usually go to Côte D'Ivoire. In Saboué, this seasonal migration is felt particularly severely because of the small village size. Many people think that this seasonal loss of people is something that "*met le village en retard*[5]". This is felt because, not only because of the loss of manpower, but also because of people returning often with serious illnesses (often mental illnesses) and also being disruptive to village life in general, having seen a 'big city'.

The Nuni have sons and daughters in Côte D'Ivoire, the villages of Sanga, Tô, Bieha, Fian, Léo and Ouagadougou.

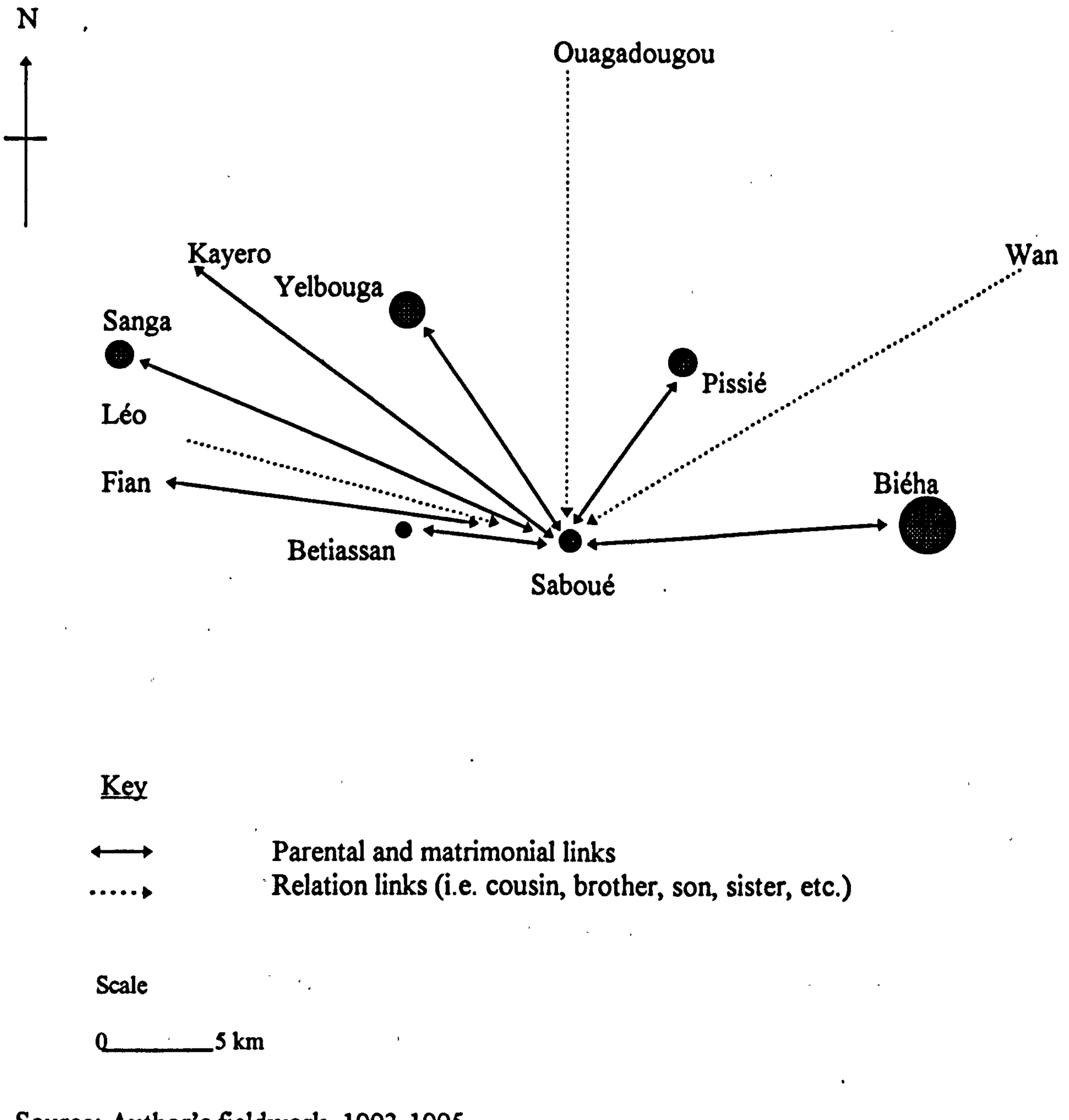
7.2.8 Networks and linkages of the Nuni

The networks of Saboué are different to the villages of Lon and Boutiourou because of its history and origins. Saboué is the youngest of the villages (as it stands as an autonomous village) but it has links with the old and well established village of Pissié which has its own networks. The village was founded by only one family and therefore only had one family as a basis to form its links. Saboué has seven links (see figure 7.3) by parentage and marriage and three links through relations working in other villages. Its strongest links will be with Pissié

[4] "sometimes you don't feel yourself in the village".
[5] "retards the village".

because of direct parentage links and it will also share in some of Pissié's links because of common parents. As the age of the village increases, and the increase in its population, then the networks will become strengthened.

Figure 7.3 Networks and linkages of the Nuni in Saboué, 1995[6,7,8]



Source: Author's fieldwork, 1993-1995.

[6] Biéha which has additional administrative links with Saboué, being the departmental capital.
[7] The information for this map was obtained through interviews with village elders.
[8] The size of the circles are proportional to the size of the villages.

7.2.9 Networks and linkages of the immigrants

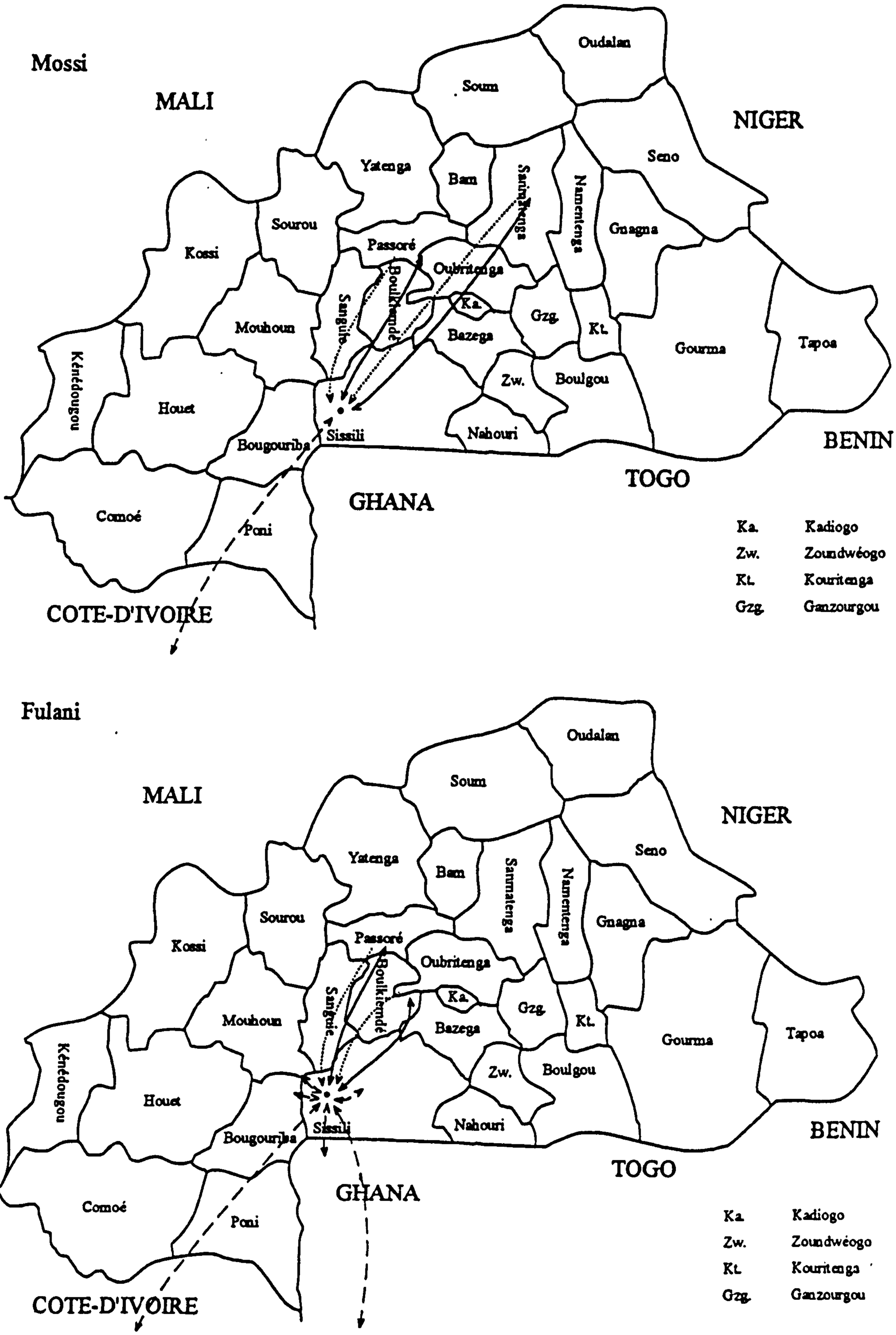
The Mossi of Saboué have come from Namentenga and Oubritenga and have links only with Côte D'Ivoire through relations working there (see figure 7.4). It is probable that these links already existed in their place of origins and they brought them with them. Because the Mossi of Saboué have only been in the village for a relatively short time, they have been unable to build up the social networks that other immigrants have built up in other villages. The Fulani, on the other hand, have significant links, because, although they have not been residents of Saboué for long they have been in Sissili for a considerable time and have moved south for pasture and water. They also have trade links with Ghana and Côte D'Ivoire.

It appears that the Mossi support networks are kept, for the most part, within the confines of the Nuni village, content to concentrate on their immediate surroundings and their neighbours and the building up of relationships therein. The Fulani however, far from being settled have their support networks distributed over a wider area and do not seem to be 'in the bosom' of the village.

7.3 Legal arrangements and administrative decision making

As has already been mentioned, Saboué is an off-shoot of Pissié and as such this complicates the customary law arrangements. As an off-shoot, the people of Saboué are, in principle still under the control of the Land and Village Chiefs of Pissié. In practice, some major events are passed in Pissié. For example, the deaths of important people and their consequent burials, the major Islamic celebrations (at least the representatives of the people of Saboué put in an appearance in Pissié in front of their Imams and chiefs). However, for the day to day affairs of Saboué, which include the allocation of land to the immigrants and the regulation of their affairs, the village chief and counsellor of Saboué have autonomy. In case of grave misdemeanours or conflicts, the chiefs of Pissié would be approached in a consultative fashion and if no consequent agreements could be made after that, then they would have the power of final decision.

Figure 7.4 The origins and linkages of the Mossi and Fulani in Saboué



These diagrams are based on interviews with Fulani and Mossi in the fieldwork 1993-1995.

It should be noted that there exists no animosity between the people of Saboué, who consider the people of Pissié as "*nos parents*[9]" and the people of Pissié. They are essentially the same family and as such share a common responsibility, i.e. that of ensuring survival for all family members. The fact that control resides in Pissié is an indication of who has the most secure production base. In this way it echoes the way a small family or conjugal unit leaves a larger family; it may take some time before the breakaway faction becomes self-sufficient, and before that family does, there are significant flows of resources and labour between the two. By retaining control, the risks are minimised on both sides: Pissié has an extra land reservoir for its higher population, which is seen in the third diagram on the evolution of space as the existence of Pissié fields in the north of Saboué's, still relatively unexploited, territory; and in case of hardship or harvest failure the people of Saboué can approach their "*parents*" for aid.

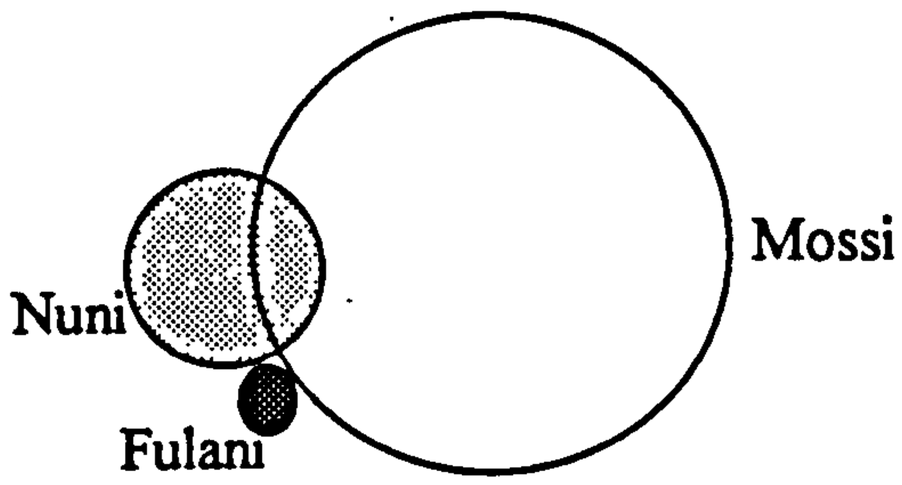
It is not known how the legal control arrangements would develop in case of an ever increasing population, but it is assumed that dialogue between the chiefs of the two villages would result in decisions that attempt to ensure subsistence for all. Because of the importance of support networks to community survival, it is unlikely that population pressure would result in a *de facto* fencing off of territories. It is in the interest of Saboué and Pissié alike to retain good relations, as it is with parents and children.

Saboué has both the largest area of territory and the lowest population. It also has had the immigrants in its territory for the shortest period. The Nuni are in the majority which is also unique in relation to the other two villages. The small size of the Nuni community means that dialogue and conflict resolution, in this case, is not difficult. However, in the traditional makeup, the Village Chief and the Village Counsellor have decision making control, with the canton leader below them and the consequent household heads below them all. The usual situation for decision making is the coming together and dialogue between the male village elders. It is very rare for one chief to make an independent decision.

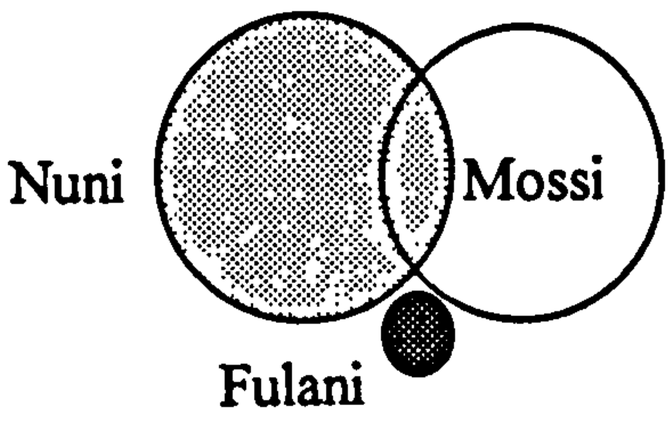
[9] "our parents".

Figure 7.5 A spatial representation of the relative interaction of the three ethnic groups in Lon, Boutiourou and Saboué.

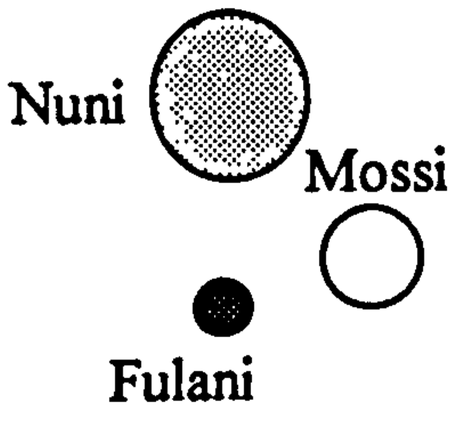
A. Lon



B. Boutiourou



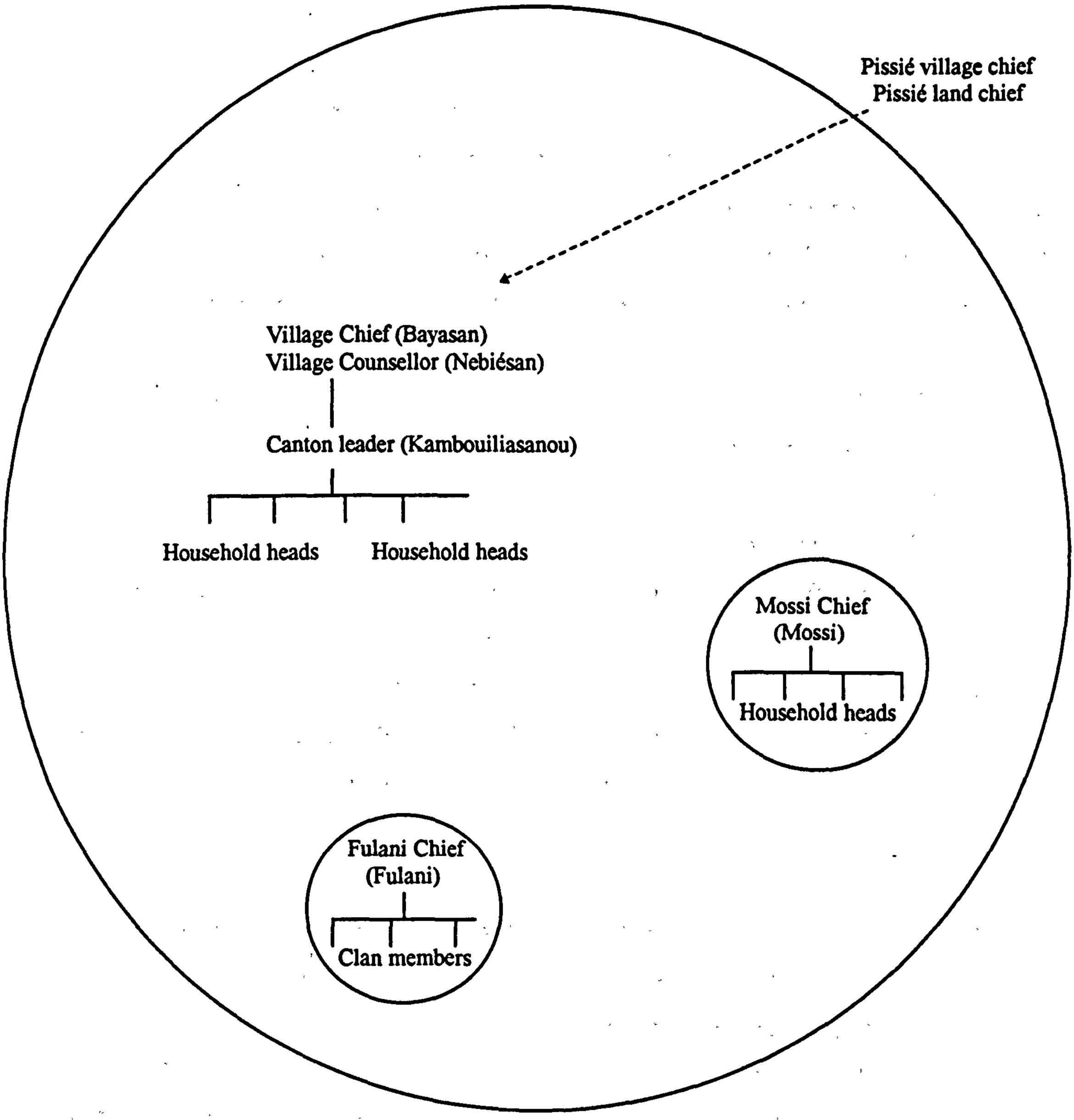
C. Saboué



Source: Author's fieldwork, 1993-1995.

The elders allotted a non defined area of land to the south of the Nuni canton where the Mossi could farm (see figure 7.2), close enough to the Nuni that they could monitor their activities. This is, unlike the Nuni of Boutiourou, who allotted a specific land area to the Mossi where they were confined to, but it is similar to the Nuni of Lon. The Mossi in Saboué have their own chief, who was the head of the first household to arrive and ask the Nuni chiefs for permission to farm. The Mossi then operate much the same as Mossi society functions in their homelands. On their own territory they regulate their own affairs, if however, more serious problems arise which concern the wider population, the problem is taken before the Nuni. As can be seen in table 7.23, there is relatively small contact between the three ethnic groups (see figure 7.5 for a spatial representation of the relative integration between the three groups in the three villages) and as such little need for regulation and a low chance of problems arising. The immigrants are very much left to themselves. This is the same for the Fulani, who again have their chief who controls the activities of his clan members.

Figure 7.6 A diagrammatic representation of the power structures in Saboué[10]



Source: Author's fieldwork, 1993-1995.

[10] Source: Fieldwork, 1993-1995.

7.4 The Nuni of Saboué

7.4.1 The Nuni production system

The Nuni family is made up of, on average, one man, the head of the family, his two wives and six children, with a higher proportion being male children (four males to two females). The head of the household usually has one or more sons and their wives and children staying with him making the average Nuni household size in Saboué is 11. The average household have also lost four children (two boys and two girls) to childhood deaths.

The Nuni fields are found in the east, southeast and south of Saboué's territory. On average, each bush field is 2 hectares, each village field is 0.5 hectares and the household fields range between 0.15 to 0.20 hectares. The bush fields range between two to three kilometres away from the village centre. The location of these fields are largely chosen by the heads of the families, and are then agreed by the Village Chief. The land is farmed for between three and five years. Farmers leave their village fields fallow for two to three years. The soils that are most commonly farmed are **tagatia, tezonou** and **tekassoulou**. Some fertiliser is bought (some buy NPK fertiliser for their yam fields) and most Nuni farmers use seed treatment before sowing. The farmers in Saboué, like most other Nuni, leave fruit and food trees in their fields.

The Nuni women have their own fields which are found next to their husbands bush fields (again they did not formally ask the Village Chief) and range from between 0.25 and 0.75 hectares. On these fields they grow red sorghum, groundnuts, maize, okra, yam, sweet potato and sorrel. The women farm the same land for three to four years and it is always virgin bush land. They say that they may come back to the same piece after 40 years but there is always virgin bushland that is cleared for farmland. The women also use seed treatments. In traditional Nuni customs, women never used to farm, it being singularly a domain of the men, but have began to farm for economic reasons and to increase contributions to the household.

Although there has been a much slower adoption of field ploughing, because of the lack of oxen there is still a feeling from the Nuni that they have a 'modern' way of farming. This

consists of using seed treatment, some fertiliser and sowing in line. An additional point made by the Nuni was that farming had become a means to make profit, whereas in the past people farmed only for subsistence.

In table 7.4, there is a description of the Nuni agricultural timetable. Every month has its own activities and is more differentiated than any of the previous villages.

Table 7.4 A typical Nuni agricultural calendar in Saboué

Month	Activity
January	Harvest of yam and sweet potato, winnowing of millet and white sorghum.
February	Selective tree felling in new farmland, upkeep of houses.
March	Field clearing.
April	Planting yam tubers.
May	Sowing early groundnut, beans and maize.
June	Sowing millet, red sorghum, cowpeas, maize and groundnut.
July	Sowing bambara nuts, sweet potato, upkeep of crops.
August	Crop upkeep, buttage, harvest early groundnut and maize and first yams.
September	Make new yam mounds, harvest cowpeas, beans and maize.
October	Make new yam mounds, harvest cowpeas, bambara nuts, groundnut and red sorghum.
November	Harvest white sorghum, millet, sweet potato and yam.
December	Harvest yam, sweet potato, winnowing of millet and sorghum.

Source: Author's fieldwork, 1993-1995

The Nuni mainly work in household units which is sufficient for most tasks, but they will help each other in times of need or to carry out work that is of common interest. The Nuni community is very small, concentrated and cohesive. Nuni groups have been formed mainly out of an economic incentive to receive external aid. There are three Nuni groups in Saboué; a men's, women's and youth group. The women's and youth group hire themselves out, mainly to neighbouring Mossi households, for agricultural activities, such as field clearing or to make yam mounds. The women's group (20 members) hires itself out at 2,000 FCFA per day and the youth group (10 members) charges 3,500 FCFA per day.

The women's group is very cohesive and has a great solidarity. It is the women's group who received the support with the dry season garden and showed great determination and hard work in the installation of the garden and the sinking of the well with the help of their men-

folk. They come together in a group when they hire themselves out, when they collect karité nuts together in the bush, when they help in the fields at seeding time and at harvest and when there is some technical training given by ADESSI or by Government services. They say "*avec le groupement les gens s'unissent et on arrive a se connaitre l'un et l'autre, donc on arrive a bien defini nos objectifs, aussi cela nous a permis de connaitre l'evolution de vie et la civilisation*[11]".

All house repairs[12] are carried out after the harvest as, frequently at this point, some of the heavy showers have damaged and destroyed some of the walls (in the 1994/1995 season the rains where so heavy and constant that many houses where destroyed when walls fell down due to saturation). The women will fetch water to mix in with the dung and mud for re-plastering (this is considered by the women to be the most painstaking task of the year). After the house repairs, done by the men, the women re-surface the floors of their yards in their compounds with a red laterite mixture. Granaries are constructed (woven) by men in November.

7.4.2 Animal husbandry

None of the Nuni households own cattle which makes it an exception. Other animals, sheep, goats and fowl, are kept for a range of reasons. Sheep and goats are kept as 'savings accounts' in case of the need to resolve family problems, or as gifts or as dowries. Fowl are used for pocket money or gifts. On average, each Nuni household has 12 sheep, seven goats, 20 chickens and five guinea fowl. In the following table, two examples are given of the uses of the incomes from different animals.

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[11] "the women unite around the group and this allows us to know each other, we can then define our objectives and this also allows us to see the evolution of life and civilisation".

[12] Building and construction within the three different ethnic groups varies enormously. For example, the Nuni build their houses with mud bricks but they also use a lot of poles for strengthening their rectangular building shapes; the Mossi use mostly mud brick and small branches for thatch and shape; and the Fulani use mostly woven grass. These housing techniques are reflected by the respective ethnic group's original environments: the Nuni having access to many poles living in a wooded environment; the Mossi using predominantly mud brick and the supple poles of smaller trees in a semi-arid environment; and the Fulani using the grasses of the pasture land.

Table 7.5 Examples of the revenue and purpose of Nuni animal sales in Saboué, 1994

Example one		**Example two**	
I sold:		I sold:	
1 goat at 3,500 FCFA	3,500	2 goats at 3,500 FCFA each	7,000
2 sheep at 4,000 FCFA each	8,000	1 sheep at 4,000 FCFA	4,000
15 chickens at 750 FCFA each	11,250	13 chickens at 700 FCFA each	9,100
I kill two or three goats and sheep for festivals and special occasions.		10 guinea fowl at 650 FCFA each I kill fowl for visitors and I killed two goats this year for festivals.	6,500
Total	**22,750 FCFA**	**Total:**	**26,600 FCFA**

Source: Author's fieldwork, 1994-1995.

Women also keep fowl, although this is a recent development, and the women that do have them only keep a few. Again, in the past women never used to keep animals. In the past, animals used to be kept for sacrificing in front of idols, although this is now an infrequent occurrence.

7.4.3 Household consumption

All the harvest (except yams) is stored in the typical Nuni granaries. Bambara nuts and cowpeas are stored mixed with ash. Millet and red and white sorghum are mixed with storage chemicals before being stored as grains. Maize is stored on the cob, without treatment and groundnuts are put into sacks without treatment. Yams are stored in the household compound under a hangar.

If the harvest has been adequate the reserves will last them until the next season. If not then they will sell the yam tubers or animals or take credit for money to buy grain. In table 7.6, consumption rates of the range of crops is provided.

Table 7.6 Typical Nuni consumption rates in Saboué for a range of crops, in percentage value of total produced

	Maize	Millet	Sorghum	Beans	Sweet potato	Groundnut	Cowpeas
Eaten	100	100	100	90	20	15	80
Sold.	0	0	0	0	70	70	0
Seeds	0	0	0	10	10	15	20

Source: Author's fieldwork, 1993-1995.

No cotton is grown by the Nuni in Saboué and the main cash crop is tubers. Saboué most resembles a traditional Nuni village of the past, compared with Lon and Boutiourou. As with the other villages, the Nuni conserve all the grains for consumption and also cowpeas, unlike the Mossi who tend to sell a significant proportion of their cereal harvest. Meat is eaten once every one to two weeks, and in the past wild meat used to be a regular part of Nuni diets. This is now less common.

The table below shows the dietary calendar of the Nuni and, similar to their agricultural calendar, shows considerable differentiation. This shows a variability in the availability of certain foods with respect to their seasonality. Wild leaves and fruits continue to provide an important component of the yearly diet.

Table 7.7 A typical Nuni food calendar in Saboué

Month	Diet
January - February	Sorghum To, yam, some sweet potato, dry okra or sorrel sauce and *kapokiér*, sometimes fresh sorrel, niébé or cabbage sauce.
March - April	White sorghum To, cowpeas, bambara nuts, okra or sorrel (dry or fresh), néré fruit, leaves of **poa** and **kagnanou**.
May - June	Millet To, very occasionally bambara nuts or cowpeas, fresh sorrel, okra or niébé sauce, fruits of detarium, néré and karité.
July - August	To of whatever cereal is left in the granary, very occasionally bambara nuts or cowpeas, fresh sorrel, okra or niébé sauce, fruits of detarium, néré and karité.
September - October	Maize To, yam, sweet potato, cowpeas, bambara nuts, fresh sorrel, okra or niébé sauce.
November - December	Maize or white sorghum To, sweet potato, cowpeas and bambara nuts, dry okra and sorrel sauce or fresh *kapokiér* sauce.

Source: Author's fieldwork, 1994-1995.

The Nuni say that today there is a better understanding of food hygiene but they also say that the quality of food has dropped, mainly because of the lack of wild meat that once formed an important part of their diet.

7.4.4 Household income and expenditure

Some Nuni families do not purchase any fertiliser but the ones that do pay on average 3000 FCFA for NPK fertiliser. The average Nuni household spends 360 FCFA on seed treatments. Most Nuni do not take credit, due to the lack of credit facilities; there is one person in the village who has a ox-drawn plough that he bought on credit from the CRPA at Biéha. They also do not hire any labour.

The Nuni will sell their harvest at two points; just after the harvest and just before the sowing period. If there is enough cereals in the granary and the Nuni family is sure that there is a surplus, they will sell the cereals around May/June just before the seeding time. This is to pay for extra labour, seeds or inputs such as fertiliser. The sweet potatoes and yams tend to be sold directly after the harvest for needed cash income (this being the first time in the year when they have significant access to money). The women will sell dried okra just before seeding and also maize, if there is enough, for the same reasons as above.

Most goods are sold at the Wednesday Biéha market which attracts commerce from many surrounding villages. Items sold by the Nuni include: groundnuts, tubers and sometimes animals. They spend money on medicines, clothes and bicycle repairs, with the biggest expenditure being the latter two.

Women sell karité butter and nuts, cola nuts, yam, sweet potato, rice (which they have previously bought wholesale and sell retail), tree fruits, groundnuts, néré flour and seeds and **soumbala**. These items are sold at Biéha and in the village. They buy clothes, beauty products (hairs plaits), jewellery, shoes, pots, salt and maggie. Their biggest expenditure is on clothes, plaits and sauce ingredients. Women also do not take credit.

The women say that in the past cowries used to be used as currency but now money is used and this has lost its value after devaluation.

7.4.5 Women's timetables

The women of have a similar pattern to their day as the women of Lon and Boutiourou. They also have the longest time for individual activities. Their yearly timetable shows a diversity of activities, including the recent addition of dry season gardening. Therefore, aside from assuring the functioning of the household the women's contribution to off-farm income and household food security is significant.

Below are timetables showing daily and yearly activities of the women of Saboué.

Table 7.8 A Nuni women's typical daily timetable in Saboué

Time	Activity
5 - 6 am	Heat water for washing,
6 - 7 am	prepare morning porridge,
7 - 9 am	fetch water, sweep the yard, wash the pots,
9 - 11 am	pound millet,
11 - 12 p.m.	prepare midday meal,
12 - 3 p.m.	individual occupations,
3 - 4 p.m.	pound flour and grind flour on the stone,[13]
4 - 5 p.m.	fetch water,
5 - 8 p.m.	heat water for the evening, prepare evening meal, eat and wash the pots,
8 -	rest and sleep.

Source: Author's fieldwork, 1994-1995.

[13] There are two stages in preparing cereal flour to make To; first the cereal is pounded in a pestle and mortar to crack the seed head to release the flour, the husks are then separated from the flour, the remaining flour is then ground with a double hand held stone on a large base stone to finely grind the flour.

Table 7.9 Nuni women's typical yearly timetable in Saboué

Month	Activity
January - February	Selling karité butter and yam, trade in cola nuts, rice, gardening, house repairs and harvest of tamarin fruits.
March - April	Harvest néré and detarium fruits, fishing, trade in cola nuts, selling karité butter and **soumbala**.
May - June	Harvest karité nuts, selling nuts, sow fields.
July - August	Farming activities.
September - October	Trading, harvest fields, drying of sauce ingredients (okra and sorrel).
November - December	Trading, gardening, cereal harvest.

Source: Author's fieldwork, 1994-1995.

7.4.6 Reaction to the immigrants

In comparison to the other villages, the immigrants and the indigenous population have not integrated on the same level. There is a separation of the production systems, each of which exists in relative isolation. This is probably due to the ample resources and the lack of need to 'pull together'. The Nuni of Saboué appreciate the presence of the immigrants because it increases the size of the village: "*Les immigrés aident le développement du village*[14]".

7.5 The Mossi of Saboué

7.5.1 First arrivals

The first Mossi arrived here in 1983, with others arriving at 1987 and 1988, mostly from the provinces of Oubritenga and Namentenga. Some travelled to Sissili on trucks which deposited them at Biéha and some led their animal herds down on foot. On arriving they visited the Village Chief who allowed them to settle on the land they currently inhabit. The average Mossi family in Saboué will consist of the head of the household, his two wives and eight children; three male and five female children. Each household has lost an average of two children, one boy and one girl. The Mossi household usually consists of two men, the family head and his son or brother and their wives. The mother of the family head may also be

[14] "The immigrants help in the development of the village".

present. This makes the average household unit as having 10 members. This is proportionally smaller than Boutiourou and Lon and is due to the small immigrant population.

7.5.2 The Mossi farming system

The Mossi farm on **bissidagaré, dagaré** and **baongo** soils to the south of Saboué's territory and cropping duration usually lasts for three to four years. Only one Mossi leaves his village fields fallow after two years cultivation. Unlike the other Mossi in other villages, the Mossi of Saboué have virgin bush to cultivate because of the abundance of land. Their field sizes range from 0.25 ha for household fields, one hectare for village fields and three hectares for bush fields. The bush fields range from 0.5 to four kilometres from their compounds. In their fields they leave karité, néré, *kapokiér*, detarium and tamarin. As well as leaving many of the trees that the Nuni leave in their fields, they have copied the Nuni's tuber cultivation to a greater extent than in the other villages. Tuber production is now a major component of their farming system. They are now 'modern farmers' as they now use animal traction and seed treatment in their farming system.

Women also have bush fields which range from 0.5 to 0.75 hectares which were given to them by their husbands (these fields have often been farmed already). They grow groundnuts, niébé, red sorghum, sorrel, okra, maize and bambara nuts. The women say that they farm in the 'traditional way', they do not purchase inputs, although organic compost and household waste will be applied, and they farm the land from between three to eight years. They also leave the wild fruit trees in their fields. Their timetable is very similar to the men's agricultural calendar although from January to May no farm activities are carried out due to the small size of the farms and the lack of need to carry out extensive field clearing.

The Mossi of Saboué, similar to the Nuni, also have a very differentiated agricultural year, with almost each month having its own separate activities.

Table 7.10 The Mossi's typical agricultural calendar in Saboué

Month	Activity
January - February	Clearing of tree trunks and branches in fields.
March	Clearing of grasses from fields.
April	Clearing field of stalks and leaves, if there is a first rain then groundnuts and yam are planted.
May	Sowing of groundnuts, maize, yam, sorghum and millet.
June	Continuation of sowing groundnuts, maize, yam, sorghum and millet, and cowpeas and weeding crops.
July	Sowing of sweet potato, bambara nuts and weeding crops.
August	Groundnut harvest.
September	Harvest maize and preparation of next years yam mounds.
October	Harvest of cowpeas, bambara nuts and groundnuts.
November	Harvest sorghum and millet.
December	Harvest yam and sweet potato.

Source: Author's fieldwork, 1993-1995.

Work is undertaken in household units, with the men, women and children participating when there is much work to be done. Work that necessitates co-operative work, such as well digging and house construction, is undertaken by all the members of the Mossi canton. This co-operative work is limited to the Mossi canton and the Mossi do not work with the Nuni, implying that there are little intra-tribal communal resources, at present, and so no mixed tribe 'group'. The Mossi women do not have a group because, they say, of social arguments.

The Mossi say they live in harmony with the Nuni and they farm in a different way because "it is our speciality". They also say, however, that their farming systems are changing little by little because of the difference in soils.

7.5.3 Animal husbandry

The Mossi keep more animals than the Nuni, although there is only one person that owns cattle which he hires out for field ploughing. The lack of cattle seems to be due to a lack of money in the Mossi community; with a calf costing somewhere in the region of 25,000 FCFA it is beyond the price limit of most of the Mossi. Most Mossi families own sheep and goats with the numbers kept ranging from five to 25 for sheep and from one to 20 for goats. Most families also keep fowl with, on average, each family keeping 10 chickens and 15 guinea fowl.

The roles of the animals as savings accounts are the same as in the other villages: "*on vend pour resoudre nos problèmes*[15]". In the first example, below the goats are sold for clothes and for money to travel to his village of origin in the north, the fowl are sold for medicines and for bicycle repairs.

Table 7.11 Examples of the revenue and purpose of Mossi animal sales in Saboué, 1994

Example one		**Example two**	
I killed two goats this year, one at Ramadam and one for Tabaski.		I killed one goat for a baptism and I kill one goat for Ramadam and one sheep for Tabaski.	
I sold: 3 goats at 5,000 FCFA each	15,000	I sold: 3 goats, 2 at 5,000 one at 7,500 FCFA	17,500
3 chickens at 700 FCFA each	2,100	6 chickens at 600 FCFA each	3,600
8 guinea fowl at 700 FCFA each	5,600		
Total	**22,700 FCFA**	**Total**	**21,100 FCFA**

Source: Author's fieldwork, 1994-1995.

The sheep give birth once a year giving one or two lambs; household sheep collections usually increase by a third each year. Goat herds double their numbers each year by giving birth twice a year, giving one to three kids. The chickens lay three to four times a year giving 10 to 13 chicks each time, although these numbers are reduced through death to between five and eight chicks. Guinea fowl lay in the dry season, laying one egg per day, and a collection of guinea fowl lay between 200 and 300 eggs per year. Some of these eggs are put with chicken eggs letting the chicken cover the guinea fowl eggs (guinea fowl are notoriously bad mothers, refusing to sit on their eggs). Using this method only yields 15 to 20 guinea fowl per year, the chicks being very prone to early death from disease.

The goats and sheep are taken to pasture in the rainy season away from the fields by the children (the rainy season being school holidays) and in the dry season they are allowed to wander around the houses in the village feeding on household wastes.

The Mossi women do not keep animals. They say that in the Mossi plateau animal keeping by women is forbidden, but, in Sissili it is not. However, even though women can keep animals, they do not.

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[15] "We sell them to resolve our problems".

The Mossi say that in the past animals were used exclusively for resolving family problems or for domestic consumption, now however, animals are kept for commercial reasons as well. Also, in the past there were less deaths and illness was less frequent, but however there were losses to wild animals. Presently, theft has become more common and deaths due to disease are more common.

7.5.4 Household consumption

The cereals are stored on the head in brick granaries with storage treatment. Cowpeas are stored with ash in the granary. Bambara nuts are stored in their pods in granaries. Groundnuts are stored in sacks in the houses and yams are stored in the compound under hangars. In a good season the food will last them until the next harvest but, like all the other ethnic groups, it depends on the season. When the reserves do not last, they sell animals in order to be able to buy grain. The Mossi of Saboué do not grow cotton and their main cash crop are tubers, a practice of the Nuni that they have mimicked. Groundnuts also provide quick cash at harvest time, which is the first money of the year. Table 7.12 provides a description of the consumption levels according to crop type. The Mossi of Saboué are unique because sweet potatoes are their most important cash crop, followed by groundnuts and yam.

Table 7.12 Typical Mossi consumption rates for a range of crops in Saboué, in percent

	Maize	Millet	Sorghum	Yam	Sweet potato	Groundnut	Cowpeas
Eaten	92.5	100	100	20	16.5	20	65
Sold	7.7	0	0	50	80	60	25
Seeds	0	0	0	30	3.5	20	10

Source: Author's fieldwork, 1993 -1995.

Meat is eaten once every two to four weeks and is either domestic chicken, or mutton or beef bought at the market. The Mossi have no hunting rights and so wild meat is a very rare part of their diet unless the occasional monkey or cane cutter is found on their fields or bush meat is received as a gift from the Nuni.

Table 7.13 A typical Mossi food calendar in Saboué

Month	Diet
January - February	Millet To, cowpeas, bambara nuts, yam, sweet potato, sauce of dried okra, sorrel and *kapokiér*, flour of baobab leaves (to put in the sauce), fruits of detarium and **ganka**.
March - April	Millet or white sorghum To, sauce (some fresh) of okra, sorrel, *kapokiér* (dry), flour of baobab leaves, niébé leaves, fruits of detarium and néré.
May - August	White sorghum To, fresh sauce of okra, sorrel, baobab, niébé, fruits of karité, liana, *raisiniér*; in August yam, groundnut and maize.
September - October	Maize To, fresh sauce of okra, sorrel, baobab, niébé, yam, cowpeas, sweet potato and bambara nuts.
November - December	White sorghum or millet To, yam, cowpeas, sweet potato, bambara nuts, dry sauce of okra, sorrel and *kapokiér*.

Source: Author's fieldwork, 1994-1995.

The Mossi say that their eating patterns have changed. In Sissili, the Mossi eat more meals per day and there are more foods available, like yams, sweet potato and rice (the latter is purchased). They used to eat more and have more meat but they said they had poorer food hygiene. The food that the Mossi eat has changed from their more traditional diet, mainly because of the introduction of tubers into their diets but also because of the different trees which means that their sauces (for which they rely upon trees for much of the year) are different.

7.5.5 Household income and expenditure

The Mossi do not purchase many agricultural inputs, with the exceptions of buying seed treatments and some fertiliser. The average Mossi household spends about 1,000 FCFA on seed treatment and about one third of the Mossi households spend an average of 2,000 FCFA on fertiliser. The absence of agricultural input spending in relation to other villages is due to the absence of cotton cultivation in Saboué.

The Mossi will do the same as the Nuni and sell their cereals if there is sufficient to see them through to the next harvest, although they will sell in January if they have enough. They sell yam and sweet potato after they are harvested in November and December but some of the

yams will be reserved for sale in March when the prices are higher. Groundnuts are sold fresh after the harvest in August and dried groundnuts are sold in April and May to pay for farming inputs. Bambara nuts are also sold for the same reason in May and June. About half the cowpeas are sold at the time of harvest and half are sold just before the start of the next agricultural season. Women sell okra from January to March.

All Mossi pay for hired labour, mostly Nuni, for agricultural activities; weeding, field preparation or making yam mounds. In most cases, twenty to thirty labour days are needed at the start of the agricultural season, for example a Mossi farmer will hire a group of five or six Nuni for four to five days at a cost of 750 FCFA per person per day; a total of around 18,500 FCFA. Some Mossi will hire an ox-drawn plough to prepare there fields at a price of 6,000 FCFA per day.

Mossi women will also hire labour albeit on a much smaller scale (because their fields are smaller). An example of a common arrangement is one woman hiring two Nuni men for two days at a cost of 700 FCFA per person per day. There is a widespread acknowledgement amongst the Mossi of Saboué that investment in extra farm labour improves yields and farm productivity.

Credit is only taken by one Mossi in Saboué and it was for an ox-drawn cart (the only Mossi in Saboué that owns cattle). Credit is normally not taken by Mossi women or men. The Mossi men sell animals, grain, tubers and matting, which are sold at the market at Biéha or Léo or amongst the villagers of Saboué. Money is spent on resolving problems, clothes, medicine, bicycle repairs, seed treatment and seeds, travelling, food and school fees (only two Mossi have children in school). The biggest expenditure is on clothes and travelling expenses.

Mossi women are in charge of selling the harvest (groundnuts, cereals, cowpeas, okra and *kapokiér*), karité nuts, groundnut butter, and rice. Most items are sold at Biéha market. Women buy beauty products, hair plaits, clothes and sauce ingredients (with the latter two items being their biggest expenditures).

Like many of the other villagers of Lon and Boutiourou, the Mossi of Saboué have been severely affected by devaluation. They say that their products have declined in price whereas purchased items (bicycle pieces, clothes, medicine) have risen. Like many others, they say that the amount of money that the individual has, has increased, but its value has declined.

7.5.6 Women's timetables

Below are the timetables for the Mossi women of Saboué. Their daily timetable is very similar to the Mossi of Lon, because an afternoon meal is prepared. Their yearly activities are dominated by small commerce of agricultural products, both via trading and sale, and by agricultural work, helping their husbands.

Table 7.14 A Mossi woman's typical daily timetable in Saboué

Time	Activity
5 - 7 am	Sweep the compound, heat water for washing,
7 - 9 am	prepare the morning and evening meals, fetch water, wash the pots,
9 - 10 am	pound millet,
10 - 12 p.m.	prepare the afternoon meal,
12 - 2 p.m.	individual work or rest,
2 - 4 p.m.	collect wood, fetch water for the evening, pound cereals,
4 - 5 p.m.	heat water for the evening,
5 - 6 p.m.	finish preparation of evening meal,
6 - 8 p.m.	food is eaten, pots are washed and put away,
8 -	rest and sleep.

Source: Author's fieldwork, 1994-1995.

Table 7.15 A Mossi woman's typical yearly timetable in Saboué

Month	Activity
January - February	Trade in rice, selling dried okra, harvest *kapokiér*, some of which is stored and some is sold.
March - April	Selling groundnuts, groundnut sauce, cowpeas, harvest of néré.
May - June	Selling groundnuts, groundnut sauce, cowpeas, harvest karité nuts, sow sauce plants and cereals.
July - August	Some selling of karité nuts, néré seeds, farm activities.
September - October	Harvest and some selling.
November - December	Drying of sauce foods and trade in rice and selling of karité nuts.

Source: Author's fieldwork, 1994-1995.

7.5.7 Reaction to the Nuni

The Mossi live in harmony with the Nuni and there are no conflicts. They say they farm in a different way to the Nuni because it is their tradition. However, they are changing their farming systems gradually as they adapt to the soils in the region.

7.6 The Fulani of Saboué

7.6.1 First arrivals

The Fulani family is made up of, on average, one man, two wives, eight children (four boys and 4 girls). The head of the household has his brothers or his grown up sons living with him in addition to their wives and family. The average Fulani household unit in Saboué is made up of 25 individuals, providing a significant labour force. Each household has experienced three child deaths (one boy and two girls). They came from the provinces of Oubritenga and Kadiogo. On arriving in the province they first stayed for six months in the village of Sissili, after that they travelled to Biéha where they stayed for two years. After they left Biéha they came to Saboué because the pasture was better. They have relations (either brother, son or daughter) in Ghana, Côte D'Ivoire, Boala, Don, Diansia, Pogo, Sagalo and Léo.

7.6.2 The Fulani production system

On arriving in Saboué, the Fulani chose a place and then went to seek permission from the Village Chief who duly gave his agreement that they could stay. They farm an average of two hectares which they cultivate continuously for four years. When a Fulani needs a new parcel of land to farm they receive old fallows. They say that their agricultural techniques have remained unchanged with the exception that now they use seed treatment and some Fulani sow in line and some use ploughs.

The Fulani of Saboué are unusual because they cultivate the additional crop of cowpeas which indicates some 'copying' by the Fulani. Like all Fulani, however, their yearly activities remains dominated by their cattle.

Table 7.16 A typical Fulani agricultural timetable in Saboué

Month	Activity
January - March	No farm work.
April	Field preparation.
May - June	Sow maize, cowpeas and red and white sorghum.
July - August	Crop upkeep.
September	Harvest cowpeas, maize and sorghum.
October	Harvest sorghum and millet.
November - December	No farm work.

Source: Author's fieldwork, 1993-1995.

The Fulani women, contrary to tradition, farm on very small parcels next to their grass huts. Here they cultivate okra and sorrel for sauce ingredients. They buy the seeds for 200 FCFA for both crops. They also help with the harvest. The involvement of Fulani women in agriculture is a significant development in inter-ethnic knowledge and habit transfer.

Table 7.17 A Fulani women's agricultural timetable in Saboué, 1993 -1995

Month	Activity
January - May	None
June	Clearing soil and sowing okra and sorrel.
July	Weeding.
August - September	Helping the husband with the harvest.
October	Harvest okra and sorrel.
November - December	None.

Source: Author's fieldwork, 1993-1995.

These sauce ingredients last the household for about four months at which point the woman has to buy the ingredients from the money earned from the sale of milk.

All the harvest is reserved for domestic consumption and none is sold. The grain is stored on the head in non-lined granaries made from woven grass. The harvest normally lasts up until April, at which point they have to sell some cattle to pay for grain.

The number of cattle in a Fulani herd in Saboué ranges from between 20 to 50 and consist of both Zebu and N'Dama cattle. In addition to the cattle, each family has on average 25 sheep, 15 goats and between five and 40 chickens and between 20 and 60 guinea fowl.

The sheep and cattle are taken to graze in the rainy season around the area of the camp up to a distance of two to three kilometres (goats are tethered around the camp in the rainy season). In the dry season, animals are taken up to 10 kilometres away in search of pasture and water. For the majority of the time children look after the herds, with adults taking charge in the dry season when distances become greater. The diets of the animals, in the dry season, are specifically supplemented with the leaves from two trees: *A.africana* and *K. senegalensis*.

The Fulani's production system has become a higher input system than in the past. The Fulani of Saboué now vaccinate their cattle three times a year and they are de-parasitised, their sheep are also vaccinated twice a year and de-wormed. In the past, Fulani used to lose large parts of their herd due to occasional epidemics.

The Fulani will come together for various tasks in the year. These include the construction or repairs of cattle enclosures that need to be rebuilt every year. This is the Fulani's biggest job (taking place in June) of the year and rebuilding or repairing can take one family up to 20 man days to carry out the work. People will also work together to build their huts, which are made just before the rainy season and are remade every three years. Collective work around their animals include vaccinating their cattle and to digging dry season wells.

Fulani women also work collectively, even though no formal arrangement exists (similar to Fulani men) as it does in both Nuni and Mossi groups. Women come together to weave the grass mats which they either sell or keep for hut construction. They often pound in groups, often asking permission to use Mossi or Nuni women's pestles and mortars in exchange or some milk. They will also harvest in a group and cement the floors in front of their huts together.

7.6.3 Household consumption

The Fulani only eat two meals per day and as seen below in table 7.18, Fulani reserve all their crops for domestic consumption.

Table 7.18 Typical Fulani consumption rates for a range of crops in Saboué, in percentage value of total produced

	Maize	Sorghum	Millet	Cowpeas
Eaten	100	100	100	100
Sold	0	0	0	0
Seeds	0	0	0	0

Source: Author's fieldwork, 1993-1995.

In table 7.19, the Fulani dietary calendar is presented. Similar to the Fulani of Lon, they only have milk in their diet for about six months of the year. The remaining time they must rely on just To and sauce. The latter is supplemented via wild leaves and wild fruit.

Table 7.19 A typical Fulani food calendar in Saboué

Month	**Diet**
January - February	White sorghum To, rarely milk, sauce of dried okra or sorrel, *kapokiér*, flour of baobab leaves, fruit of detarium.
March - May	White sorghum or maize To, rarely milk, dried okra sauce, sorrel, flour of baobab leaves, fruit of néré.
June - August	Sorghum, maize or millet To, milk, fresh sauce of okra, sorrel, baobab leaves, niébé.
September	Maize To, milk, cowpeas, fresh okra sauce and *kapokiér*.
October - December	Maize or sorghum To, milk, dried okra sauce, sorrel, flour of baobab leaves, fruit of *kapokiér* and *Diospyros mespiliformis*.

Source: Author's fieldwork, 1994-1995.

Meat is eaten once every two to four weeks and is generally reserved for special occasions and the Muslim festivals.

The women say that in the past eating habits were less sanitary because they used to live in open shelters, but now it is better. Also, in the past, milk was always available, now there tends to be a shortage of milk in the dry season.

7.6.4 Household income and expenditure

With the exception of hired labour, the only external agricultural input used by the Fulani is seed treatment. For this, the average Fulani household will spend 460 FCFA. No fertilisers are purchased. They also hire labour to do the field preparation and weeding. An average Fulani household will hire either Mossi or Nuni (usually the latter) for two or three days. For example, one Fulani family pay a group of four Nuni for 1,500 FCFA per day for two days. Fulani women will, also surprisingly, hire agricultural labour even though their land parcels are very small. They hire Nuni workers, usually only for a day to prepare their plot and a day to weed. For example, one woman hired two Nuni for 500 FCFA per day and another hired one Nuni to weed her plot at 300 FCFA per day.

The Fulani men spend their money on animal vaccinations, grain, clothes and bicycle parts. Their biggest expenditures are on grain and on animal vaccinations. Women will buy sauce ingredients, clothes, seeds, medicines, shoes, pots, beauty products and calabasses (for their milk). The biggest expenditure is on clothes and sauce ingredients. Women sell milk, karité nuts and animals at the market.

Each Fulani household will sell about five or six cows for anything from 40,000 to 60,000 FCFA. This is at the lower end of the price bracket because cattle sell from anything between 30,000 to 100,000 FCFA depending on the animals weight and age and according to the season. Each person will also slaughter at least one sheep or goat and five or six chickens for festivals. See table 7.20 for an example of the significant yearly income from the sale of animals in one Fulani household.

Table 7.20 An example of the revenue and purpose of Fulani animal sales in Saboué, 1994

An example of income from the sale of animals for one family	
I sold 5 cattle for on average 45,000 FCFA each	225,000
I sold 11 goats for 7,000 FCFA each	77,000
I sold 12 chickens at 800 FCFA each	9,600
I sold 10 guinea fowl at 600 FCFA each	6,000
I sold many guinea fowl eggs	40,000
Total	**357,600 FCFA**

Source: Author's fieldwork, 1994-1995.

Fulani women also have their own animals, separate from those of her husband, although the women do not own any cattle. It is more common for women to own goats than sheep as the former are associated with the camp and are not taken to pasture, although, one Fulani women interviewed did own six sheep. Women in Saboué owned between two and seven goats, between three and 12 chickens and up to 20 guinea fowl. They can use these as they want without seeking permission from the husband.

They sell fowl and eggs at the Biéha market and their cattle at the Léo market or they will sell them to travelling buyers. Milk products will be sold by the women in and around the village and often milk buyers will come to the Fulani camp.

Devaluation has hit the Fulani like everybody else. Even though their cattle are demanding higher prices, the price of animal medicine and vaccinations has also doubled. The Fulani used to barter milk for cereals and other products, but now this is no longer accepted.

7.6.5 Women's timetables

Table 7.21 and 7.22 show the Fulani women's daily and yearly timetables. Like the Mossi of Lon, the Fulani of Saboué do not prepare an afternoon meal. This meal will be replaced with a milk or yoghurt drink when they are available. Like most Fulani women, their daily and yearly timetables are dominated by milk treatment and preparation when the animals are lactating. When there is no milk, besides ensuring the functioning of the household, Fulani women of Saboué will collect karité nuts for sale and weave grass mats.

Table 7.21 A Fulani woman's typical daily timetable in Saboué

Time	Activity
5 - 7 am	Heat water for washing, sweep the floors, collect milk, prepare and eat breakfast,
7 - 9 am	treat the milk,
9 - 10 am	pound millet for evening meal, fetch water,
10 - 12 p.m.	collect wood,
12 - 2 p.m.	individual activities,
2 - 4 p.m.	fetch water and grind flour for evening meal,
4 - 6 p.m.	prepare evening meal and treat milk,
6 - 8 p.m.	eat meal and arrange the pots,
8 -	rest and sleep.

Source: Author's fieldwork, 1994-1995.

Table 7.22 A Fulani woman's typical yearly timetable in Saboué

Month	Activity
January - February	Collect potash, very occasional selling of milk.
March - April	Mat weaving, very occasional selling of milk.
May - August	Collect karité nuts, selling of milk, sow okra and sorrel.
September - October	Help with the harvest, selling of milk and karité nuts.
November - December	Collection of straw for preparing potash and selling of milk.

Source: Author's fieldwork, 1994-1995.

7.6.6 Reaction to the Nuni

The Fulani have no problems living with the Nuni

7.7 Ethnic interrelationships in Saboué

The immigrants have been in Saboué for the shortest duration out of the three villages and as such the new, emerging production systems are still relatively immature. The three ethnic groups exist more or less independently of each other and contact is not on the same level as Lon or Boutiourou where ethnic contact is becoming essential for the functioning of the respective production systems, see figure 7.23.

Table 7.23 Ethnic interrelationships in Saboué.

Fulani ⟶ Mossi	• Milk products. • Weaved mats. • Dung. • Trade over Ghanaian frontier.
Mossi ⟶ Fulani	• Labour. • Sale of foodstuffs and cereals. • Dolo.
Fulani ⟷ Mossi	• Animal sale.
Fulani ⟶ Nuni	• Milk products. • Gifts. • Dung. • Animal sale. • Grazing animals on post-harvest fields. • Trade over Ghanaian frontier.
Nuni ⟶ Fulani	• Land. • Administration. • Foodstuffs, cereals, tools, etc. • Labour.
Fulani ⟷ Nuni	• Trade.
Nuni ⟶ Mossi	• Land. • Administration.
Mossi ⟶ Nuni	• Dolo. • Sale of cereals, foodstuffs, etc.
Nuni ⟷ Mossi	• Some exchange of trade and information.

Source: Author's fieldwork, 1993-1995.

The ethnic groups in Saboué have the most minimal intra-ethnic contact of all the villages. This is because, at present, there is no reason to co-operate: there are no resource shortages, there is ample land available to allow for the large spatial differences in settlement patterns, and the proximity to the large market of Biéha means that intra-village trade is minimal. The proximity of Biéha, its size, its human resources (it contains extension workers from most sub-ministries, health, animal and agriculture.) and its Wednesday market means that any requirements in terms of advice, trade or commerce can be fulfilled. There are also other sizeable Mossi and Fulani communities nearer Biéha that provide points of contact for the Mossi and Fulani of Saboué.

8. COMPARING DIFFERENCES

Chapter overview

This chapter examines the major differences in the three villages and makes conclusions from comparing those differences. In section 8.1, the farming systems are compared as well as the available off-farm income opportunities, specifically those available to women. Differences and similarities in household consumption and animal husbandry in the villages are also examined in this section. Section 8.2 attempts to explain the land use changes seen in the villages and finally, 8.3 looks at what the changing resource use patterns meant for the rural development project.

8.1 A comparative analysis

8.1.1 Overview

" *His* [the African farmer's] *bonds are to his family, not a plot of earth*" (Spencer-Trimingham, 1959:5)

In this chapter, the results and analysis of the village study findings are compared to provide a sense of the difference and diversity between the villages. It becomes clear that there are similarities between villages and the ethnic groups that have developed through inter-ethnic exchanges and through entitlement rights. The following discussion examines the major influencing factors, both internal and external, on the predominant production systems and attempts to explain the nature of the changes on the original farming systems and the development of the new resource arrangements. Finally, and perhaps most importantly, these

findings will be put in the context of ADESSI's rural development project by asking; what do these questions mean for rural development projects in Africa?

This study has nine variables. Firstly there are three tribes, the Nuni, Mossi and Fulani, which have three very distinct farming systems. These three ethnic groups and their respective production systems are located in three villages which have very different resources. There are 533 villages in the province of Sissili, a good proportion of these villages have an immigrant population and conditions and resource use arrangements in each village is likely to be different. In this study only three villages have been examined. Generalisations about the effect that population pressure has on local production systems are difficult to make. In the following section, an examination of how the farming systems of the ethnic groups differ amongst themselves and between villages.

8.1.2 A comparison of the farming systems

"*Farming systems may be quite different in localities only 10 to 20 km apart*". (Richards, 1985:85).

The Nuni farming systems in the three villages show variations in their timing and crop mixtures. As the introduction says, Sissili is divided into the northern sudano-sahelian and the southern sudano guinean zone, and these can be seen in the cash crop divisions of cotton in the north and tubers in the south. Lon, in the north, grows both cotton and yams but the former dominates household income from crop sale (the Nuni in Lon are also unique because they grow sesame, a habit they have copied from their Mossi neighbours). This is in contrast to Saboué where no cotton is grown, but yams are extensively cultivated. This situation reflects the local ecology, soil conditions, rainfall and cultural preferences, with the Saboué having heavier soils and higher rainfall which are more suitable for yam cultivation. The Nuni in Boutiourou have recently started to cultivate cotton, but yams remain central to their household economy. This shows a diversification in the agricultural revenue generating practices of the Nuni. The Nuni from Boutiourou have been encouraged to grow cotton by the extension workers from the SPA, and in the first few years, it has proved successful, with the cultivators making a profit.

Apart from yams and sesame, the crop mixture is the same in all villages with farmers growing millet, maize, red and white sorghum, beans, cowpeas, sweet potato, groundnuts and bambara nuts. These crops are grown on the village and bush fields. Similar to the Mossi's ring management regime, the Nuni will strategically place their crops on respective areas of the farm, with earlier maturing varieties and crops needing more fertilisers (e.g. maize, cowpeas) being grown on the village fields and crops needing larger surface areas that are later maturing (e.g. sorghum, millet, sweet potato) being grown in the bush fields.

Generally the agricultural year can be divided into three parts: rest and field preparation, seeding, and harvest. In Lon the fields are cleared twice, once in January where the large shrubs and cotton stalks are cleared, this is then followed by a period of rest then the fields are cleared again in April directly before sowing. In both cases, fire is used as a means of clearing the field. In Lon, in October, when the soil is moist, the next season's yam fields are prepared (making earth mounds for the tubers). In Boutiourou, the fields (yam and other crops) are prepared (i.e. cleared) in September and then left until April. At this time the wood has dried out and can be burnt (although not in the yam fields as they need living trees to act as stakes enabling the runners can climb). Although in Boutiourou there is a heavier workload in September with field preparation falling at the same time as the harvest, it affords them more time in January to March. This difference in field preparation is due to the density of the bush and presence of fallows. In Boutiourou, woody savanna or old fallows may be exploited which, once selectively felled, need much drying, out but in Lon cultivation of younger fallows means that they can be cleared quicker with less preparation needed (young trees dry out and burn faster than older trees). According to farmers, the advantage of returning to fallows is that they are easier to clear (Schrekenberg, 1996:77). In Saboué, the agricultural timetable is different again, e.g. in January the harvest of tubers still continues. This is because of the greater moisture content and retention of the soils which allows the tubers to grow and develop in the soil and become larger in size (and demand a higher price). Farmers in Saboué do not begin to clear their fields until February and they burn the felled trees in March. Thus, it appears, that they have no agricultural rest period and are working in the fields to greater and lesser degrees throughout the year.

The Mossi, like the Nuni, have small differences in their farming calendars in the different villages. The clearing and preparation of the fields generally takes place from January to March, with perhaps one month free. Seeding takes place in April for Lon and Saboué but occurs one month later in Boutiourou. The Mossi of Lon and Boutiourou are similar to the Nuni of the case-study villages because of their field preparation habits (the Mossi of Boutiourou are the only group to make compost pits on a large scale due to their poorer soils). The Mossi of Boutiourou prepare their fields in November for the following season, whereas the Mossi of Lon do not, waiting until the start of the year. The Mossi of Saboué prepare yam fields in September when the soil is moist and easily workable. The Mossi of Lon are the only Mossi group which have not adopted yam cultivation, which is due to the limits of climate and soil rather than an unwillingness to be involved in agricultural knowledge transfer. It is not unusual that other Mossi have adopted the Nuni habit of yam cultivation; yams are a very viable cash crop which grow well in the southern half of Sissili (particularly in the area of Saboué). The Nuni have copied the Mossi habit of sesame cultivation because of the suitable conditions and the Mossi have done likewise with the yams.

The Fulani farming calendar echoes their northern pastoralist roots. In all the villages they grow only cereals and start their farming activities late in the season compared to the Nuni or Mossi. The Fulani of Lon and Saboué sow in May and those of Boutiourou sow as late as June. Their main crops are maize, millet and sorghum and the Fulani of Saboué also cultivate cowpeas. Most of their time is taken up with their herds and it seems that the present levels of agriculture are the limit in terms of how much time and energy they are prepared to invest.

The differences in timing, workload and cropping patterns means that the villagers have different responses to household food security, different workloads at different times and different rest periods, all of which need to be considered when looking at the totality of the production system. In terms of rural development programmes, it means that a different approach is needed for each village.

8.1.3 Women's agriculture and off-farm activities

"*West African farming households are characterised by a relative autonomy of men's and women's incomes and expenditures. As in the rest of Africa, gender based responsibilities are very explicit*" (Schrekenberg, 1996:243)

As the above quote points out, women's and men's responsibilities are very different and are very explicit. However, this is not to say there is no co-operation between sexes. The main production objective is the survival of the household, and even though men and women may have separate incomes and expenditures there is significant co-operation, and investment is always for household survival.

Women play a vital role in the agricultural calendar and, in the cases of Lon and Saboué, in the direct production of crops. The extent of women's role in agriculture has changed over the years, with women now cultivating into the bush where they used to only cultivate their kitchen gardens or household fields. Also, over time, more demands have been put on women to become increasingly involved in agricultural work which means some tasks previously carried out by women have been scaled down or been pooled into the general household tasks carried out by all members, such as the gathering of fuelwood and wild foods.

In Lon, women grow a diversity of crops on surfaces up to a maximum of 0.5 ha. Women's crops are dominated by groundnuts but also include 'sauce' crops, e.g. sorrel and okra, and the major grains. Women do not cultivate tubers in Lon as it is considered to be too heavy work for the women. Women in Nuni society have, for a long time, cultivated groundnuts for cash sale and regardless of which crop a woman is growing, when asked the men will say "*elle cultive ses arachides*[1]", perhaps this is due to the embarrassment caused by a woman growing the crops that traditionally the man should be responsible for. The women are given the land (usually recent fallows) by their husbands and have started to farm to help the family and also to increase their own incomes from the sale of their harvest. The Nuni women of Boutiourou do not have personal fields but help the men with their farms, especially in the times of weeding and with the harvest. This is due to an agricultural system

[1] "She is cultivating her groundnuts".

that currently provides for household food requirements and allows for more diverse off-farm activities. They do however have a collective farm where they cultivate groundnuts in their group (*groupement feminine*). The Nuni women are much more involved in the processing and sale of karité and néré products. The Nuni women in Saboué also have their own farms which are very similar in character to the women's fields of Lon. Here they grow red sorghum, groundnuts, maize, okra, yam, sweet potato and sorrel. These fields serve a dual purpose; to contribute to household food security and nutrition (more so than the men's crops which are aimed at providing the bulk staple, whereas the women's fields often provide most of the sauce ingredients), and providing them with some income from the sale of the produce. The women of Saboué also have a dry season garden which supplies them with vegetables throughout the dry season.

The women play an important role in the intensification of the agricultural system and by producing a surplus for sale. Where women do not have their own farms, other income generating activities, such as petty trading or commerce, dominate their activities.

Normally, Fulani women do not farm for themselves, but they may help with the harvest as they do in Lon and Boutiourou. However, unusually in Saboué, some of the women have their own small plots where they grow sauce ingredients, mainly okra and sorrel. This is solely for household consumption and to save money from the ingredients that they would normally buy in the market place.

In addition to the agricultural work, women provide a range of complementary goods for household survival. These off-farm activities include, the making and sale of potash, soap, snacks (*galettes*), dolo, yoghurt, curd, **soumbala**, *karité* butter, the collection and sale of néré and karité seeds, trade in cola nuts, cereals, rice and selling sauce ingredients and milk. The dominant activities vary between ethnic group, for example, dolo is predominantly a Mossi woman's activity, milk, yoghurt and curd sale is restricted to Fulani women. Nuni women tend to be involved in a multiplicity of activities which may include making **soumbala**, karité butter, soap, potash, cakes, small commerce in cola nuts, collecting and selling néré and karité seeds, *kapokiér* calyxes and detarium fruit and selling of dry sauce ingredients. Nuni women spend less time on the farm than the Mossi women and so have

more time for off-farm income generating activities. This provides a different level of stability in the household economy as more diverse off-farm sources are being used for income generating activities. Women spend their money on a range of products, including sauce ingredients and items for their children.

There remains a division in the male and female economies within the same household. As Guyer (1986:322) says "men and women ... separately control productive resources, take partly independent decisions, manage personal incomes, assume different responsibilities and favour different investments". However, the degree of the independent decisions vary. For example, the domestic economy of the Mossi revolves around the farm to a greater extent than the Nuni. Mossi women spend more time on the farm, helping their husbands, contributing to overall household food security in a more direct way, i.e. by helping to produce the food. However, they also employ a range of income earning activities which provide women with income of their own which is used in a similar manner to Nuni women. The Fulani have a very different range of income earning activities which mainly centre around milk transformation and sale. Fulani women are traditionally linked with lactating animals and are responsible for milking for household food and selling. Previously, milk and its products would have been exchanged for other goods such as cereals but, with the increase of the cash economy, this is increasingly becoming rarer.

The off-farm income provided by the women is vital to the survival and growth of the household, with specific reference to ensuring child health.

8.1.4 Household consumption in the villages

Household consumption varies between ethnic group, some consuming most of their harvest, others selling a relatively high proportion. The sale of non-cash crops is incidental in cases when there has been a seasonal bumper harvest; it is not a conscious 'surplus-generating' strategy. The Mossi are more integrated into an exchange/cash economy than the Nuni, relating to the Sahelian tradition of trade. Although, the Nuni will sell portions of their harvest (if there is surplus) in the rainy season to buy agricultural inputs. The Nuni consume about half of their yam harvest (the other half is sold), most of their beans, a small

proportion of their sweet potatoes and cowpeas. The last two are predominantly cash crops and around three quarters of the crop is sold. Some of the groundnut harvest is consumed but, again, most of it is sold as a cash crop.

There is a variation in the levels of consumption of the different crops in the different villages. In Lon, a small proportion of the cereal harvest is sold, in Saboué, all of the harvest is destined for household consumption but in Boutiourou quite a significant proportion of the cereal harvest is sold. The Mossi of Boutiourou sell portions of all their crops: all of their cotton, two thirds of their groundnuts; one third of cowpeas, half the sweet potatoes and three quarters of their yams. In Saboué, half the yams are sold, three quarters of sweet potato, two thirds of the groundnuts and a quarter of the cowpeas. In Lon, all the cotton is sold, half the cowpeas and a third of the groundnuts are sold.

There are several possible explanations for these patterns. Either, the harvests in Boutiourou are large enough to allow the Mossi to sell significant portions of their harvests, or, the natural bush around the village provides enough wild foods and, the Mossi household fields provides enough sauce ingredients to satisfy the Mossi's nutritional requirements. Contrary to this is the situation in Lon, where, they consume the majority of their harvests, but their harvests may be inferior to those of Boutiourou, or, it may be because of their larger families. They still, however, sell some of their cereals, which, if the harvests did not suffice, would never be sold unless in extreme emergency. An additional explanation may be that they produce enough cotton to afford to purchase extra food rations when necessary. The Mossi of Saboué most resemble the Nuni in their consumption patterns, with all of the cereals and cowpeas being consumed and the major cash crops being groundnuts and tubers. This may be due to the similarity of the Mossi farming to the Nuni farming system; the harvests are the same and, consequently, so are the consumption patterns.

The Fulani only engage in agriculture to take some pressure off their herds and do not sell any of their produce. All is consumed.

The dietary habits of the tribes reflects their cropping patterns; the Nuni and Mossi eat a relatively wide range of foods, whilst the Fulani have a much more limited range which is

dominated by purchased sauce ingredients and milk. Gathered foods, such as tree leaves and fruits, play a vital part in the diets of the Nuni and Mossi. Although it was said by the Fulani that they do not eat tree leaves, in all the villages they are known to consume baobab and *kapokiér* leaves. They particularly play an important role in the dry season, right up to the hungry period, when other food sources are in short supply, helping to extend the stored food supplies and improve nutrition. The most common wild foods amongst the Nuni and Mossi are the leaves of baobab[2], *kapokiér*, **pelgha, kankalga** and **katepoadga**, and the fruits of néré[3], karité[4], wild grapes, **ganka**, liana, **kagnanou** and **boubalio**. All of these products are gathered by the respective tribes from the village territories. Schrekenberg (1996) showed that fields and fallows are as important as the woody savanna areas for NTFP. She noted that forest areas are only exploited for rare products such as medicines, canes and building materials unavailable on fallow lands, as well as for traded products, where supplies on nearby fallow are insufficient. For people specialising in NTFP trade, the forest is still their domain; for domestic consumption however, field and fallow suffice. Thus, the majority of these tree products come from the fields and fallows and are from are the trees that are left when fields are cleared, trees which have a use.

One aspect of the consumption habits that has radically altered is the presence of wild game meat in the local diets. It seems, from interviews with elders, that wild game meat used to be a very important part of local diets. Now only domestic meat is eaten and this is a relatively infrequent occurrence. The three tribes are largely vegetarian (due to the nature of the investment in animals) and live predominantly off To and sauce.

Table 8.1 provides a summary of the three farming systems in the villages and their respective similarities and differences.

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[2] Baobab leaves have a high calcium content (2.26 mg per 100g), a high phosphorous content (226 mg per 100g) and a high protein content (13.1g per 100g) (Schrekenberg, 1996).

[3] **Soumbala** which is an integral part of the Nuni, Fulani and Mossi diets has been shown to be (moisture free) 40 percent crude protein, 35 percent fat and 15 percent carbohydrate. It is also high in lysine which is a limiting amino acid in the west African savanna region, it is also high in riboflavin which is also a common deficiency (Schrekenberg, 1996).

[4] Karité butter which is used in most cooking contains 800 Kcal per 100g and no cholesterol (Schrekenberg, 1996).

Table 8.1 A comparison of the three farming systems in Lon, Boutiourou and Saboué, 1993-1995

Description	Nuni	Mossi	Fulani
Lon			
Farm size:household field village field bush field (distance)	0.25 ha 0.75 ha 3.75 ha 1.75 km	0.3 ha 0.5 ha 4 ha 2 km	1.5 - - -
Common crops	Millet, maize, sorghum (red and white), yam, groundnut, beans, cotton, cowpeas, bambara nuts, sesame, sweet potato.	Millet, maize, sorghum (red and white), groundnut, beans, cotton, cowpeas, bambara nuts, sesame, sweet potato.	Millet, sorghum (red and white), maize.
External inputs	Hired labour, cotton insecticide and fertiliser, seed treatment.	Hired labour, cotton insecticide and fertiliser, seed treatment.	none.
Boutiourou			
Farm size:household field village field bush field (distance)	0.5 ha 2 ha 3 ha 2 km	0.25 ha 1.5 ha 3 ha 1.5 km	2.25 ha - - -
Common crops	Millet, maize, sorghum (red and white), yam, groundnut, beans, cotton, cowpeas, bambara nuts, sweet potato.	Millet, maize, sorghum (red and white), yam, groundnut, beans, cowpeas, bambara nuts, sweet potato.	Millet, sorghum (red and white), maize.
External inputs	Hired labour, cotton insecticide and fertiliser, seed treatment.	Hired labour, cotton insecticide and fertiliser, seed treatment.	none.
Saboué			
Farm size:household field village field bush field (distance)	0.15 ha 0.5 ha 2 ha 2 km	0.25 ha 1 ha 3 ha 1.5 km	2 ha
Common crops	Millet, maize, sorghum (red and white), yam, groundnut, beans, cowpeas, bambara nuts, sweet potato.	Millet, maize, sorghum (red and white), yam, groundnut, beans, cowpeas, bambara nuts, sweet potato.	Millet, maize, sorghum (red and white), cowpeas.
External inputs	Seed treatment.	Hired labour, seed treatment.	none

Source: Author's fieldwork, 1993-1995

Farming systems further north are more extensive relative to those further south. In Lon, the bigger bush fields (of both Nuni and Mossi) show the greater reliance on those areas to provide the household's staple and the main cash crop (cotton) and the size also reflects the more widespread use of the plough. The household and village fields are also smaller in Lon, with high external agricultural inputs. It is apparent that the more northern areas are in the

process of an intensification of their farming systems which is more accelerated than those in the more southern areas. Vierich (1986:164) in her study of two tribes in Burkina Faso (one immigrant, one local) also finds this:

> *"New technology was adopted both where pressures for increased productivity were greatest, according to the existing social organisation of production ...by the same token, the greater pressure on land among the Bwa farmers and the poorer quality of their land, determined by ethnic relations and historical events, resulted in cropping patterns and uses of new technologies quite different from those employed by the Dagara-Djula within the same village setting".*

This is also true for Boutiourou and Saboué, but to a lesser extent (with Saboué with the lowest pressure on resources). Boutiourou and Saboué have larger village fields which indicates that a higher proportion of the household's food needs are produced here and also the differing cash crop, yam, opposed to cotton. This arrangement also reflects the more productive southern soils which can produce more from a smaller area - a more intensive system. Boutiourou, however, partly because of its higher population, has higher agricultural inputs to maintain soil fertility, whereas in Saboué the fertility of the natural vegetation, the availability of land and the ability to fallow for long periods ensures production capacity.

8.1.5 Animal husbandry in the villages

Animal husbandry activities amongst the three ethnic groups are significantly different and there are also additional differences in husbandry activities between the three villages.

In Lon, each Nuni household owns on average 30 fowl, two thirds of households own seven sheep and five goats, and one third of Nuni households own one cow. In Boutiourou, each Nuni household has 35 fowl, seven goats, five sheep and approximately a half of Nuni households own one or more cows. In Saboué, each Nuni household has on average 12 sheep, seven goats, 25 fowl and no cattle.

The differences in the animal figures between the Nuni can be related to the local production systems. For example, there is a higher number of cattle kept at Boutiourou because of the higher incidence of ploughed farming. The *Gestion de Terroirs* project provides credit for

cattle-drawn ploughs and the SPA based in Léo has an extension worker which trains villagers in the use of cattle drawn ploughs, it is a farming technique that has been very heavily 'sold' to the Nuni and Mossi alike. However, the presence of the NGO and Government extension services in the village is related to two things; firstly, Boutiourou's proximity to Léo, where the services have their headquarters, and secondly, the tendency of the Government services to identify villages which already have a high population of animals and then offer extension services, rather than attempting to initiate activities. This latter point is due to the lack of resources in Government sub-ministries and their desire to seen to be working effectively with the resources they have. This often results in the extension services 'high-jacking' already successful projects and calling them their own.

In Lon, there is a relatively lower, but nonetheless significant number of Nuni who own cattle. This, again, is related to the prevalence of ploughed agriculture, but because of the expense of the ploughs themselves, as well as the cattle, and the absence of any credit facilities in the village, there are less households with cattle. In Saboué, the Nuni hire a Mossi's cattle drawn plough if they want to plough their field. There are no credit facilities in Saboué. The presence of credit facilities in the localities for the purchase of cattle-drawn ploughs seems to be the limiting factor on the ownership of cattle.

The distribution of sheep and goats throughout the villages is relatively similar. The families that lack sheep and goats are the 'younger' families who do not yet have the capital to invest in these animals and are limited to keeping fowl. There is a slightly higher number kept in Saboué which may be due to the absence of cattle or a need, because of a lack of other resources, for a savings system. It appears that around 12 sheep and goats (with the respective reproduction rates) is adequate to cover the 'emergencies' and festivals in a year for a household.

Half the Mossi households in Lon own one or two cattle, two thirds own sheep and goats, with numbers ranging from anything between seven to twenty of each species. Every Mossi household owns from between 10 and 100 chickens and on average 20 guinea fowl. In Boutiourou, two thirds of the Mossi own one or two cows, each household has between seven and 12 goats with one third of all household owning about four sheep. Each

household has on average 25 fowl and there are two families who keep pigs. In Saboué, only one person keeps a cow which he hires out for field ploughing. Each Mossi family owns 25 fowl, between five to 25 sheep and from one to 20 goats.

In the Mossi communities there is a larger range of animal numbers with some Mossi owning a significant number and others only a few. Some Mossi invest much time and money into animal husbandry because it provides considerable returns. Others however, keep animals as the Nuni do, for insurance and as 'ambulatory savings accounts'. In Lon and Boutiourou, a significant proportion of Mossi households own cattle because they practised ploughed agriculture in the Mossi Plateau, this is a habit they have brought to Sissili. On their arrival, thirty years ago, it is unlikely that many Nuni would have experienced plough farming, as all agriculture was done with the **daba**. The Mossi families, who do not own cattle, lack the finances or credit facilities to buy a cattle-drawn plough. Ploughing is seen as part of the process of agricultural modernisation and it is every farmers wish to become '*une cultivateur moderne*'. The Mossi keep proportionally more sheep and goats than the Nuni[5] which indicates either a lower willingness to sell their animals in times of need (by liquidating other resources or having enough saved cash) or more investment in their care and reproductive activities. The Mossi prefer goats to sheep which is another relic of their years in the Mossi plateau; goats are more suited to the drier conditions and have a traditional place in the northern Mossi's diet. The Mossi keep fowl as the Nuni do, as spending money if the need arises or as food for guests. Twenty five fowl suffice for these needs in a year.

Animal husbandry for the Fulani is entirely different from animal husbandry amongst the sedentary Mossi and Nuni. For the Nuni and Mossi animals are where surplus from the production system is invested, for the Fulani on the other hand, animals are their main livelihood strategy and as such are the focus of most of the Fulani work. De Boer and Kessler (1994:42) note:

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[5] There is a higher spread of the number of animals amongst the households which suggests a higher number of 'younger households' (i.e. break-away conjugal units from the parental household) and so a lower purchasing power. The majority of the Mossi have been in Lon for almost 30 years, Boutiourou for about 15 years and Saboué for ten years and, for most of their time, they have been in household groups. However, the longer the Mossi stay in an area the more likely there is to be split off factions, i.e. members of that household who want independence and the ability to start their own household. In Lon, this is a process that has been continuing for some years, in Boutiourou, it has started but is not as widespread as in Lon, and in Saboué the households are still largely intact in the forms that they first arrived in.

"La production d'un troupeau de bovins est de plusiers sortes: du lait, des veaux, viande, du fumier et du labor de trait. Le troupeau représente aussi une 'caisse d'épargne', un signe de richesse, un symbole de prestige[6]".

The figures presented below show that agricultural production is more important than animal production in the satisfaction of domestic nutritional needs. However, the Fulani only grow cereals to take the pressure off the animal herd.

The Fulani household in Lon has on average a herd of 70 cattle[7], 10 goats, 60 sheep, 20 chickens and 40 guinea fowl. In Boutiourou, a Fulani household has on average 40 cattle, 10 sheep, 10 goats, 15 chickens and 20 guinea fowl. In Saboué, the average herd size is 37 cattle, 25 sheep, 15 goats and 80 fowl. Below is a comparison between the major aspects of the Fulani production system in each of the villages.

Table 8.2 A comparison of the Fulani production system in Lon, Boutiourou and Saboué, 1993-1995

	Lon	**Boutiourou**	**Saboué**
Duration of stay	10 years	15 years	17 years
Duration of cultivation	2 years and 2 years fallow with corral[8]	3 years with 3 years fallow with corral	4 to 5 years
Farming techniques	No 'modern' techniques	Seed treatment only	Seed treatment and ploughs
No. of cattle sold (for cereal purchase)	2 to 3	5 to 6	5 to 6
Distance of pasture	5 to 6 km	2 to 3 km in rainy season, 5 to 7 km in dry season.	2 to 3 km in dry season, 6 to 10 km in dry season.
Length of time that harvest lasts	May/June	June/July	April.

Source: Author's fieldwork, 1993-1995.

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[6] 'A herd of cattle provide many different production roles: milk, calves, meat, manure, and labour for working. The herd also represents a 'savings account', a sign of riches, a symbol of prestige'.
[7] Dahl and Hjort (1976) say that a family that lives uniquely from cattle needs at least a herd of 50.
[8] The cattle are corralled on old fields for two years to improve their fertility, these fields are then farmed for two years.

The Fulani of Lon have the shortest cropping duration on the same piece of land, and, as can be seen, their harvest lasts for a significant part of the year (in second place of the villages). This is due to the relatively poor condition of the soils and which produces the need for quite an intensive regime of inputs, i.e. cattle manure. This is also the same for the Fulani of Boutiourou who practice a three year cultivation and a three year corralling. Here, the harvest lasts the longest which is due to a combination of relatively good soils and the practice of manuring (from the corrals). The Fulani of Saboué cultivate what are mature secondary woodland (i.e. very old fallows) with no corralling. The latter group does, however, spread cattle manure on their fields and also allows cattle to graze on the fields after the harvest. In Saboué, the same piece of land is farmed for four to five years, which provides them with cereals until April (the shortest time that the harvest lasts out of all the villages). It seems that the practice of fallow and manuring increases the harvests. The practice of seed treatment may also contribute to bigger harvests with less seeds and seedlings being lost from fungal attack. The practice of ploughing in Saboué is a result of its proximity to the pastoral zone of Yalé where the Government runs extension services aimed specifically at improving the pastoral production system.

The number of cattle sold in order to purchase additional cereals for the household is dependent on how big the household is. In Lon, the households are smaller and so less cattle need be sold (only 4.3 percent of their herd are sold). In Boutiourou and Saboué, the household sizes are much bigger and there is thus the need for more cash to purchase extra grain (12.5 percent and 13.4 percent their herds are sold respectively). Despite these sales, there is considerable growth of the herd sizes each year even in the latter two villages. Lon shows growths in herd sizes of 25 percent, Boutiourou has a 12 percent growth and Saboué of eight percent per year[9]. It is likely, however, that some of these heifers may be lost due to illness or sale[10].

The distances that are covered in search of pasture and water vary between the village with the Fulani in Lon practising a constant transhumance all year round and the Fulani of

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[9] These calculations are based on herd composition of 70 percent females of which 77 percent are of breeding stock (see de Boer and Kessler, 1994) and breeding intervals of 16 months. The figures produced by de Boer and Kessler, 1994, were verified through interviews and were found to be roughly correct.

[10] It is not certain what proportions these are.

Boutiourou and Saboué practising seasonal transhumance. de Boer and Kessler (1994) showed that the routes and movements of cattle indicate that the southern herds spend less time travelling and more time eating than the northern herds, although similar times are spent drinking and resting. The movements of the northern herds do not significantly change throughout the year whereas southern herds move less in the start of the dry season. de Boer and Kessler (1994) suggested this was because:

1. there is better quality forage in the south and the less favourable situation in the north makes it obligatory that the herd moves throughout the year;
2. the northern herds are bigger and therefore must travel more extensively to satisfy the food requirements of the herd.

Northern herds spend more time grazing in the fallows in contrast to herds in the south. There are advantages and disadvantages for the Fulani in each area. For example, the best grazing in November and December is found in the agricultural areas (in post-harvest fields). Between February and April, however, the best areas are in the south where there is more woodland. This requires mobility. However, whilst the grazing is better in the south there are problems of water shortages, with the shallow wells drying up in the dry season and the permanent wells being predominantly located in the agricultural zones (Berger-Sarl, 1989) .

There are various differences in the animal husbandry of the two sedentary tribes and that of the Fulani. For example, the Fulani herds are composed mainly of Zebu cattle (up to 90 percent) whilst the Nuni and Mossi favour N'Dama or cross breeds. The Fulani lose a higher proportion of their animals through disease and death than do the Nuni or Mossi. The Fulani lose twice as many heifers than the Nuni or Mossi; the latter provide supplementary feeding to their animals which is rare amongst the Fulani. The Nuni and Mossi often keep their animals in the village in the dry season because there is permanent water from the village wells and the stocked crop residues provide for fodder requirements. However, the objectives of the respective systems are quite different: whilst the Nuni and Mossi have a very small number of animals used predominantly for draught power and savings accounts, they can afford to intensively care for them; the Fulani production objective on the other hand is to produce lactating cows for milk and the production of heifers for sale on the

market (Toulmin, 1983) which requires an extensive production regime[11]. However, it is interesting to note that there is little difference between the animal productivity in the three ethnic groups. In all systems, the age of the reproductive maturity in cows is 42 months, the intervals between births are 16 months and the growth of the cattle vary between weight gains of 45 to 50 kg per year (de Boer and Kessler, 1994). These values indicate good productivity levels.

It is unusual for a Fulani to engage in other activities outside of animal husbandry or agriculture in contrast to the Nuni or Mossi. A few Fulani may be involved in craft production, making hats, ropes or mats. Others may guard the animals of the Nuni or Mossi (these may be young sons of the Fulani families that do not yet have any animals or who have lost their own herd). The Fulani have a long history of interaction with farming groups and the integration of cattle and crops has high exchange entitlements. Hart (1982) says: "the two groups [farmers and Fulani] have long interacted peacefully in most areas; the complementarity of their production schedules is a strong inducement to symbiotic co-existence".

8.2 Discussion of analysis

8.2.1 Explaining land-use change

The previous section has highlighted that there are three very distinct farming systems that belong to three different groups and these are manifested in three different ways in the respective villages. Each ethnic group has adapted its production system in relation to the available resources and the wider customary law system. Over time these systems have evolved into systems that are characterised by relatively high levels of inter-ethnic exchange, whether this is physical exchange or information and counsel.

It is apparent that there are new islands of opportunity as land frontiers are managed rather than closed. Farmers continue to have a range of possibilities and choices for expanding or strengthening their production system. This is due to several factors; firstly, the cohesion of

[11] Extensive grazing has a positive influence on natural vegetation; the dissemination of seeds, and an opening up of the woody cover allowing an optimum exploitation of the herbaceous layer.

the management schemes already in operation, secondly, the co-operation between farmers and ethnic groups in relation to experimenting with new agricultural techniques and new income generating activities and, thirdly, the range of choices that are affected by local services, Government and NGO, depending on if the village is targeted. These opportunities are open to all as resources remain under common property management and these common property resources are vital for subsistence and exchange for all the ethnic groups. When pressure exists on these resources, adaptive responses, through customary law mechanisms, address the problem. These customary law arrangements are also dynamic and have grown to include the opinions of the immigrant groups when pressure on common property resources exist, as in Lon. Thébaud (1995) noted that the customary law systems are more endogenous than traditional, establishing tenure arrangements in response to problems, potential or constraints. Tenure systems and customary law arrangements are not static; they are influenced by many things that can be near or far from the affected group. For example, the alteration of favourable or unfavourable climatic periods cannot be overlooked as a factor in transforming certain tenure practices (Thébaud, 1995). Customary law arrangements are as dynamic as the forest boundaries.

The local production systems are overlain by the change from Animism to Islam rather than from subsistence (pre-capitalist) to a high market presence (developed capitalism). The following points illustrate the weakness of the penetration of the market and show how the household, local economy of affection and over-riding religious system are more likely to affect production and consumption decisions.

- The internal dynamics of the household are more important than external capitalist forces and it is the household that determines the economic and social organisation (Hyden, 1986). It is because of this that the religious transition has more impact on the actions of the household or, more importantly, more value is placed on moral codes and religious beliefs which accordingly shape production and consumption patterns. Likewise, as Mauss (1954) says, there is a continuous and necessary mutual exchange between society and environment, which is certainly not dictated by 'the penetration of the market'.

- There is an assumption that a concentration by farmers on food production implies a 'subsistence' orientation, a lack of 'penetration' by market forces, or the 'survival' of elements of pre-capitalist modes of production (Richards, 1985). However, whilst this may influence local systems, it may be more appropriate for local economic explanations to realise that farmers specialise in low-profit/low-risk activities like food production and local trade rather than high-profit/high-risk activities linked to urban merchants and long distance trade routes (Last, 1980). It is more likely that the supercedence of Animism has had more impact on resource use and production patterns rather than the presence of capitalist forces in the region.

- Money is only one aspect of the local economy of affection and is by no means the most powerful, and as local moralities are more influential than capitalism, the changing religious environment will have a greater impact. As Mauss (1966:1) says, "the characteristics of pre-industrial societies can be called 'total social phenomena' where all kinds of institutions find simultaneous expression: religious, legal, moral and economic".

- It has been assumed that west African farmers have (or had) a self-contained circuit of food production and consumption and that subsistence was total. It was also assumed that the market would penetrate into this subsistence circuit and disrupt and transform it. This however was not the case; the notion of subsistence is relative, never absolute, and individuals may do a great deal for themselves but not everything (Hart, 1982). Even when the circulation of commodities was minimal, complex social organisation intervened systematically in the economic affairs of the household (Hart, 1982). Thus the assumption that modern capitalism will now 'do-the-trick' in transforming local economies where others have failed is somewhat ridiculous considering the more powerful prevailing morals of the local religious system which shapes the complex social organisation. Adams (1993:49) explains the relationship between 'market' and 'moral' economy in Mali.

> *"The distinction between 'moral' and 'market' economies in Mali is blurred by a long history of coexistence. Commodity exchange blends with patron-client relations as local market traders provide interest-free cereal loans to reward the loyalty of rural clients. In a similar way, the volatility of cropping fortunes and need for money income has necessitated the development of broad and diverse*

transfer networks which encompass local reciprocity as well as wider orbits of exchange involving urban migrants, market traders and the state".

The form of Islam in this context is not a fundamental and oppressive religion, it is West African Islam. It is an Islam that has brought texts and rules but it has also allowed the customary chiefs to interpret the customs, Koranic principles and administrative rules more or less as they see fit (Thébaud, 1995:22). Just as customary arrangements are dynamic, so Islam is shaped to further household security. The local communities in this area have survived Djerma invasions and French imperialism - capitalism and Islamic fundamentalism can not be assumed to drive away the local moral economy.

8.2.2 Possibilities and choices for new livelihoods

It is difficult to identify why farmers choose the livelihood strategies that they do in a transitional time. However, regardless of the chosen strategy, the major motivating factors for change come from endogenous (socio-cultural determinants) rather than traditional or exogenous (government policies, technologies) factors. In other words it is people (farmers) that change their farming practices in a context of complex social organisation and not technologies: thus, "farmers, not fields, make decisions on technology" (Byerlee et al, 1982:899). It also becomes clear that there are a range of choices available, either through extension practices, NGOs and private channels, that are never chosen. The reasons, among others, for this are, the techniques, technologies or approaches

- do not fit into the peasant's production system;
- are 'single-sector' approaches, i.e. provide one service (whereas peasant technologies provide for multiple roles);
- are prohibitively expensive and beyond the peasant's spending power;
- are culturally not acceptable.

However, there are imported techniques that are accepted by local farmers, either because they already fit into their existing production systems or they have the potential to increase productivity or income through their integration with other resources that have recently become available, e.g. through the arrival of the immigrants.

8.2.3 Land use change in relation to national agricultural policy

It has already been shown that Government initiatives to attempt to control land distribution and resource arrangements have failed because of, firstly, lack of resources and, secondly, the absence of communication channels down from department to village level. The Government has also taken no steps to attempt to control and direct the immigration process; it has all been led by the local communities. However, once the immigrants had settled, the Government have attempted to support agricultural systems through land use intensification programmes led by the *Centre Regional de la Production Agricole* (CRPA)[12]. These local programmes have been small scale and underfunded by the Government although some support has been given by *Sixiéme* FED and cannot be said to have reached all the villages in Sissili. In relation to the Government's impact on production systems, it is ultimately up to the farmer's groups to choose what they perceive to be beneficial for them.

The CRPA, which organises crop and livestock services in Burkina Faso, is currently trying to promote a modernisation approach with small farmers. This approach includes: the use of draught power for ploughing (labour saving devices); the use of chemical fertilisers, the most predominant being NPK and urea (to increase yields); the use of pesticides (predominantly for cotton); and the use of fungicidal seed treatments. The CRPA and the SPA encourage sowing 'in line' as a result of ploughed agriculture because it allows easier weeding and fertiliser application. Through the extension services of the CRPA and SPA/SPE, these techniques and technologies are introduced to the local communities.

The materials needed for a 'modern' farming system are supplied through the departmental CRPA offices. Credit schemes are offered on ploughs, donkey carts and fertiliser, pesticides and fungicides are available to buy. The latter items are often bought by local businessmen (stall holders) and sold retail in small quantities. Local projects (e.g. the *Sixiéme* FED's *Gestion de Terroirs* project) have also provided the inputs listed above on credit or on loan.

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[12] The CRPA is the third rung in the national agricultural institutional hierarchy: the Ministry of agriculture and livestock controls the Directorate of agricultural extension which directs the CRPA's activities. Underneath the CRPA are the regional SPAs and SPEs which then organise their activities on agricultural extension zones. There are 12 CRPAs which are delineated along ecological lines (Bindlish et al, 1993).

Although the CRPA does not have supplies to cover all the villages in Sissili, many villages do have access. For example, Lon, close to Cassou, and Boutiourou, close to Léo both have access to 'modern' materials. However, Saboué has limited access because of its isolation. Consequently only one farmer has a plough which he took on credit (in the other villages a relatively large number of farmers have ploughs). It seems, not unusually, that the more accessible the villages are, the more likely they are to have access to modern materials. Access is one thing, affordability is another. Bindlish et al, (1993:15) said that farmers indicated that a financial constraint prevented them from adopting extension messages on seed treatment, chemical fertiliser and animals draft. Thus, it also critical to have credit schemes.

A compounding, and probably the most critical factor in the changing farming systems, is that the new modern techniques are used by the Mossi immigrants, who have brought the techniques from the Mossi Plateau. Agricultural extension has been more prevalent in the north of Burkina Faso (where much of the external aid channelled through the Government was invested) compared to the south. The Mossi Plateau, in particular, has been a target of the CRPA and its technologies. Farming in the north is more suited to ploughed agriculture, partly because of the already integrated position that cattle play in the production system and partly because of the treeless fields which are conducive to ploughed agriculture. Thus, the Mossi introduced the modern practice to Sissili and the CRPA and SPA 'taught' the Nuni how to do it themselves. For the last 5 years, the Nuni have said they have been 'modern' farmers.

8.2.4 Diffusion of ideas

The previous section explained a process where the Nuni saw the Mossi farming system in practice and judged it worthy to take it up themselves. Arguably, without the presence of the CRPA, NGOs (who are also involved in the 'intensification' of the farming systems) or the SPA/SPE, the Nuni would have taken it up eventually. However, the presence of the three institutions speeded up the process considerably. A more telling example of copying is the uptake of 'buttage' or mound making, by the Mossi and the uptake of yam farming. These are examples of the immigrant population copying farming techniques and crops which are

specific to the local agro-ecosystem. There has been, in the two southern-most villages, a change of the main Mossi cash crop, from cotton to tubers. Although the Nuni of Boutiourou cultivate cotton in addition to yam, it is because they have a larger land areas to exploit and can cultivate the two simultaneously, whereas the Mossi with a limited land area must choose the crop which yields the highest returns. As cotton quickly exhausts the soil and needs a relatively large land surface to be economically attractive, yams are their best option.

The Mossi (and Fulani) say that the Nuni are specialists in the way they farm in relation to the local conditions. It is therefore not surprising that they should watch and copy. The crop makeup of the Nuni and the Mossi in all the villages is very similar. An additional copied crop is sesame. The Nuni of Lon have taken up sesame cultivation after seeing the returns accrued by the Mossi. When two sedentary tribes live in close proximity for a prolonged period of time without conflict, it is not unusual to see a cross transfer of techniques, ideas, technologies and innovations.

8.2.5 Directions of agricultural development

In the north, the Mossi practice an extensive form of agriculture, dominated by cereal production, on their bush and, to a large extent, on their village fields, cultivating relatively large areas (up to 10 hectares) using crop rotation and short fallows for soil fertility management. On their household fields, intensive cultivation is practised through their use of inputs such as fertiliser and labour. The farming systems in the Mossi plateau have seen a transition from the long fallow system to the short fallow system as a result of population increase and resource degradation caused by harsh climatic conditions. This change resulted in a concentration on cereal production which require smaller inputs of labour, smaller yields per hectare (in terms of calorific value) and hence the need to cultivate relatively large surface areas, often with the help of ox-drawn ploughs. The dominance of cereals weakens the resilience of the production system because of the similarities in their growth cycles and harvesting times. This means that extensive, cereal dominated, farming systems are more susceptible to climatic variations. This does not imply that the regions are overpopulated, but that, more importantly, it is the transition from long fallow to cereal dominated short

fallow which can lead to recurrent harvest failures (Boserup, 1972). This implies that the Nuni have a more resilient and 'safe' farming system that the Mossi, possibly explaining why the Nuni escaped the worst effects of the droughts and became the point of arrival for the migrants.

The Nuni have traditionally practised an intensive form of agriculture, cultivating small surface areas (up to 2 hectares) which is dominated by tuber production, using a long fallow system as the main soil fertility management technique. This production pattern was noted by Boserup (1972:32); "under the system of forest fallow, it is possible for a family which cultivates and consumes mainly root crops to produce the amount of basic food it needs from a very small area".

The results the study has produced, shows a vibrant and growing local agricultural economy in the province of Sissili. The forecast of the direction of agricultural growth, based on the analysis in this study, are in agreement with Boserup and not Malthus. A higher provincial population are being supported through the adoption of the plough by some groups and the increased complexity of socio-economic systems. The study has shown that a decrease in the fallow period is not necessarily a destructive phenomena, and, in agreement with Boserup, indigenous technological developments is the route through which more people can be supported than previously. Far from widespread environmental degradation, the new lifescapes have seen an intensification of management systems, and, if anything, an increasing number of trees in the landscape as farmers begin to integrate cultivated trees into their management systems.

In addition to this, farmers in the villages are increasing the amount of inputs they are putting on their fields. These include, seed treatment, chemical and organic fertilisers, pesticides, ox-drawn ploughing, hired labour and some agroforestry and soil and conservation measures. These inputs and knowledge of these inputs have been introduced through external services and cross-cultural knowledge transfer.

8.3 Continuity and change

It cannot be disputed that there has been significant change in the province of Sissili, both in social and environmental terms. This in itself refutes the static 'Merrie Africa' viewpoint (Giblin et al, 1996:2), and the survival of the three ethnic groups (and it could be argued their increasing prosperity) is a testimony to the benefits of change. There are also certain aspects to the overall production system which have stayed the same, such as the dominance of the traditional legal and administrative systems, but even these have slightly altered. With such dramatic influences that Sissili has experienced since the 1970s, it is perhaps more useful to talk about convergence and divergence.

Convergence is taken to mean the extent to which the characteristics of the three ethnic groups are merging, with specific reference to their farming systems. This process is a result of a diffusion of ideas because of the ethnic groups proximity to one another and realisations of the benefits of each characteristic that is 'copied' or blended into existing habits. Divergence relates to the specialisation of the ethnic groups in contributing to the lifescape, i.e. the overall production system in the village territory which includes: the systems of consumption; the exchange system; the living or residence system; the tenure system and the appropriation of land; the valuation system; the ecosystem; the politico-administrative system; and the communication system (UNSO, 1994).

Evidence of divergence can be seen in the level of inter-ethnic transfers (seen in figures 5.23, 6.23 and 7.23) in the villages. These inter-ethnic transfers, which can also be called exchange entitlements, are evidence of specialisation between ethnic groups which ensure livelihoods, i.e. everyone has a specific niche. The number of inter-ethnic transfers, or the complexity of the system, reflects the length of time the three groups have been co-habiting, their physical proximity and the pressure on resources. The number of ethic transfers also, ironically, reflects the degree of convergence the groups have experienced, i.e. the new lifescape owes its resilience and stability to the presence of the interactions between all the groups. Like a natural rainforest ecosystem, its size and complexity contributes to its stability and ability to withstand shocks. In human terms, this translates into how the entire lifescape minimises risks and guarantees subsistence for all.

In terms of the case study villages, Lon has the most exchange entitlements because it has the longest history of immigration and has experienced the greatest pressure on resources (i.e. a relatively high population and soils of a low to medium potential), followed by Boutiourou, followed by Saboué, that has a very limited inter-ethnic transfer. In Saboué, it is again reflected by the length of time of migrant settlement in the area, but also because of the physical size of the territory and its abundance of woody biomass (which ensures soil fertility); there is little pressure on resources. However, there is still some divergence, i.e. ethnic specialisation, which strengthens existing livelihoods. A greater divergence experienced in the village shows that the economy is becoming more complex; people are responding to the opportunities that become apparent with a richer ethnic group mix and their respective specialities.

The increasing complexity of the systems in relation to higher populations and pressure on resourses has a number of implications, not least on sustainability. There are two dominant arguments on environmental sustainability in situations of demographic change; Boserup versus Malthus. Neo-Malthusians say that increased population pressure leads to degradation of natural resources; followers of Boserup say that increased population leads to innovations in agricultural technologies and techniques which support the increased numbers. In this case, Boserup's side is taken, with increasingly complex societal relationships illustrating the response to increased population. The local social systems have also been shown to be continuously changing and adapting, through negotiation, in response to other things, such things as Islamisation, with the objective of ensuring a sustainable future. In the case of the future of villages in Sissili, using the example of Lon, it would seem that their sustainable futures are made up of a tri-cultural mix, the members of which have specialised functions which are a response to opportunity, rather than constraint.

If there were widespread environmental degradation it would be evident in arising conflicts, either environmental conflicts, e.g. soil erosion or a reduction of biomass, or social conflicts, between ethnic groups. It is easier to detect social conflict, and, in the case study villages, it is absent. The environment is managed at different levels. It is managed by the local Chiefs, both immigrant and local, through their systems of land distribution based on need. This is

achieved through negotiation with village elders, which, depending on the history and level of immigration, is carried out with local and immigrant. Then there is the head of the household who, acting as manager of household resources (especially labour), attempts to ensure the sustainability of the resources he has available, the most essential of which is land. Finally, there is environmental management by men and women, who, having control over different resources, manage 'their' resources as productively as possible. It is evident that through the process of specialisation and inter-ethnic transfer, more space is available to women to engage in more diverse activities, thus strengthening the household economy. Women also respond to opportunity. Thus, the human agency in the villages have ensured against environmental degradation through negotiation, entitlement exchange and specialisation.

This demonstrates that lifescapes are mobile in place and time. This example also gives some indication how the populations of the Sahel and its regions have created new environments and livelihoods throughout history. This also shows that the peasant mode of production is not only resilient but also dynamic. The blending of cultures, religions and economies has been done throughout history to ensure survival of the community and the building of new lifescapes. Thus, no 'stage' in the development of communities can be identified, rather there exists a constant evolution, which, at every stage, attempts to ensure sustainable futures.

8.4 What this meant for *Projet Agroforestier*

People make decisions on the basis of available choices. Decisions are also influenced by prevailing belief systems, social dynamics, economic preferences and resource availability. People need to make new choices to suit new situations. Rural development projects should empower local communities to make choices of their own to suit their own lives. Sometimes choices cannot be made without the introduction of new technologies or resources, or at least the development of new technologies from existing ones, and this is another job for rural development projects.

In this section we will concentrate on the three different interventions of ADESSI in the three village case studies[13].

8.4.1 Three places: three approaches

The three villages have very different conditions and motivating factors and each village required an approach that was tailored to their particular needs. This has the end result of the villagers expressing their needs, working out approaches and implementing activities with ADESSI as the facilitating force. In order to understand community needs through the use of PRA, an intense period of dialogue over a long period of time is needed. The understanding that the project workers gain develops slowly through the villagers' patience and explanation. The project worker needs to understand, among other things, the local social and land use history, current village land management practices and inter-ethnic relations. As more time, and a greater understanding is gained and the villagers become aware of the project's objectives (i.e. to support the villagers in auto-development activities) then more problems will arise that need solutions. Dialogue and good communication is the first step to solving a problem.

In the context of changing farming systems and the move to become "*une cultivateur moderne*" it is necessary that an array of resource use options are available for the local communities. The presence of multiple options strengthen the ability of the village groups to make decisions, because they have more choices. The process of analysis and action also benefits the group's long term ability to develop new options and technologies for themselves, even if it results in things not to try. This process has been dubbed Participatory Technology Development (see ETC International, forthcoming). The different activities carried out in the villages (see chapter three) contributed to the development of the range of choices and was developed through the interaction between the project and the villagers.

Another aspect of the project that was vital to sustaining development activities was the stimulation of dialogue between villagers from different villages. The value of different village groups engaging in discussion cannot be overestimated. Therefore, a programme of

[13] ADESSI had other villages where they worked but for reasons of length only the three case study villages will be examined.

visites intervillageoises was arranged that took villagers from one area to visit villagers in another who were involved in improved land management practices. In these situations both groups learn from each other, from their mistakes and successes, and it also strengthens the farmers' abilities to analyse why certain approaches worked in certain areas and why they did not. It is the approach which is important and not the technique.

In one inter-village visit, I took a group of farmers from three different villages who were interested in starting dry season gardening activities, to visit a successful dry season garden[14] near the town of Koudougou. My role was limited to logistics, i.e. getting one group of farmers in contact with another, then allowing them to talk together. The visit was particularly successful and ended with the president of the group who we were visiting asking a member of the visitors, "*et le blanc? Qu-est qu'il fait ici? C'est le chauffeur ou quoi?*[15]". Thus, discussing options and finding new things to try does not need the interjection of western scientific knowledge. The visiting villagers then returned to their villages, translated what they saw near Koudougou to the other villagers. Whether or not they initiate similar activities in the near future is not important. What is important is the dialogue and discussion on alternative ways in which to engage in measures of intensifying production; of *producing nature*.

ADESSI was funded to engage in agroforestry activities in the province of Sissili, that was its mandate. By conventional agroforestry or forestry standards, I would have achieved little success in working with local communities. This is attested to by the failure of ADESSI's first phase of activities; expensive centralised nurseries, with high inputs and paid staff and no participation by the local communities. The second phase of forestry activities was characterised by low staff numbers (my counterpart and myself), little money (about £4,000) but high contact with villagers. With these resources it was possible to identify what people really want, in this case (and with our mandate), it was small tree nurseries and dry season gardens to fulfil their tree and vegetable needs.

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[14] This was not a 'on-station' garden but one that had been developed by the local group with some support from a local NGO.

[15] "and the white? What is he doing here? He's the driver or what?"

This is not the place to examine why many rural development projects in Africa have failed despite the high levels of monetary and human investment. But some questions should be brought to light. Firstly, we must ask ourselves, where are those resources and money being invested? In administration or in the villages? Secondly, how are project staff relating to local communities? Are they 'telling' or are they talking? Thirdly, is the research rapid and extractive or interactive? Are they rapidly finding parts of the picture or are they slowly piecing together local realities? And finally, whose agenda are they responding to? The international community's and/or Government's or to local communities?

These questions need to be asked in the context of lifescapes, not landscapes or water catchments. Questions need to be directed at people. Therefore to understand answers, lifescapes should be the point of reference.

9. CONCLUSION: AFRICAN REALITIES AND WESTERN DREAMS

Chapter overview

This chapter begins with a introduction (9.1) that outlines the discussion on how western thought differs from rural African thought (9.1.1). The chapter then goes on to examine why we have not been able to understand African economies (9.1.2) and how can we better understand African economies (9.1.3). Section 9.2 examines local environmental management and the new emerging development paradigm and section 9.3 looks at the lessons learnt. Section 9.3.1 discusses the impact the research has had on myself, 9.3.2 examines the impact of the rural development project on the villagers and 9.3.3 concludes the thesis with an examination of the impact the research has on development.

9.1 Introduction

What becomes clear, from the arguments within this thesis, is that western professionals, those educated in the 'north' and development 'experts' have had problems in understanding peasant modes of production and African thought systems. In this first part of the conclusion, this substantial stumbling block is examined and pointers are given as to why this is so.

9.1.1 Western scientific thought versus rural African thought

"*The world does not look the same from down among the millet stalks as it does from a Boeing 747*" (Hart, 1982:6).

The quotation above says many things, not least about scale. It implies not only a lack of understanding from many of those who travel in aeroplanes but it also implies an inability to

understand and learn. Two different worlds are in existence, worlds that are not stages in a linear development but are two separate kingdoms of existence and comprehension, operating at different levels.

Many of the problems of development come from misconceptions of problems and the inability of development professionals to understanding the complex African systems of *modus operandi*. This is our[1] problem and largely stems from the assumption that 'development', as defined by capitalist economics, is a linear process of modernisation that has manifested itself by careful manipulation in western Europe, some parts of Asia and the United States of America. This is our model, our school of thought and our playground and it is this that we try to initiate in the Third World so we can have more playmates. From this angle, African rural communities are in a stage of development that is comparable to pre-feudal Europe. The notion of this 'stage' of development has been carried over from the colonial period (1850-1950) where the 'natives' were constructed as backward or childlike and the colonisers as rational agents of progress (Gardner and Lewis, 1996). The aim since the post World War period has been to speed up that process of modernisation using capitalist economics to achieve 'development'. To this end, large sums have been spent and ambitious programmes have been attempted through a global effort (north to south) but, as the Millennium is reached, Africa rural communities remain much the same as they did after the World War II. Life expectancy has increased but per capita income has declined (Chambers, 1997).

It would be wrong to say that the international community has not recognised the minimal impact of development programmes on local African economies and it would also be wrong to say that no efforts have been taken to address the problem. People have blamed the failures on inappropriate technology, on socialist African Governments, on a lack of participation by local people, on corruption, kleptocracies, on poorly trained African development workers and extensionists (the list goes on) while still retaining the central tenet: capitalist modernisation is the aim of all endeavours. There has been a re-examination of approach to look at failures but there has been no examination of the prevailing mode of thought in the development business. Quite simply, the crisis of development stems from the

[1] In the following text when 'we' or 'us' is referred to it means western professionals who have been trained in the western school of scientific (and all its political connotations) thought.

fact that African economies have separate identities and have different agendas to western economies and as a result we have understood very little of their lives and priorities. Hart (1982:126) illustrates this:

> *"West Africans spent a relatively small number of man-hours per year on acquiring their food, whereas by European standards they may have spent an extraordinary amount of time on funerals. Who is to say that the maintenance of relations between the living and the dead is less important than growing plants?".*

When we start realising that there are other economic forms, which work in non-monetary ways, then real development initiatives can be started. Why have we not been able to understand African economies?

9.1.2 Why we have not been able to understand African economies

"*As captives of the systems we have created for ourselves we are not well placed to appreciate values and rationalities other than those which are modern*" (Hyden, 1980:3)

The central assumption of capitalist development theory is that pre-capitalist economies must be transformed into capitalist economies which will bring access to all modern basic needs and more. Pre-capitalist economies (as they have been dubbed by western professionals) are low down in the linear development scale and need to be pushed up the ladder. It is necessary to put their systems aside, under the table of history, i.e. there can be no complementarity. However, like the persistence of Islam and Animism, things are rarely that cut and dry. Hart (1982:9) argues, it is not particularly useful to talk about the intrusion of 'money' or 'the cash economy' which implies an abrupt confrontation that never took place in modern times. Mauss (1954:86) adds to this point when he says, "We should not believe that the introduction of a new economic system necessarily kills the old one, or that societies are either 'traditional' or 'modern'". Why then do we expect that such things will happen in Africa?

It is necessary as a starting point to understand that African economic processes are rarely linear and are often complex and seemingly confused; African logic is different from Western logic. An example of this difficulty in understanding is African legal and tenurial arrangement

that have often been the subject under scrutiny by western observers. This has special reference to customary law and common property resource use arrangements which remain heavily studied in the hope that some classification system can be developed allowing categories to be created and understood. Thébaud (1995:6) says arrangements under common property useage rights can sometimes be disconcerting for modern law. She goes on to say (1995:12) that there is a cleavage between a European view of private property and the complexity of access and useage rights over natural resources in Africa which has always made them very difficult to understand.

The modernisation paradigm dominates mainstream thought (Gardner and Lewis, 1996) and money is the oil that makes the wheels turn. In African societies there are a great many other things which are necessary for the functioning of their economies and societies. Eriksen (1995) says, "the economy is an integrated part of a social and cultural totality and economic systems and actions can only be fully understood if we look into their interrelationships with other aspects of culture and society". The 'economy' is at once a universal structure and an isolated sector that cannot be understood in relation to itself alone. For example, Malinowski (1950) noted in the Trobriand Islands there is no word for 'economy' as an institution separated from social life. The complexity of the African economy has ensured its misinterpretation by western researchers who have been unwilling to loosen themselves from preconceived ideas about linear development. In addition to this, western economists have been obsessed by profit margins and the maximisation of resources. Sahlins (1972) says that the concept of the maximising individual is meaningless in societies where the unit of production is the household and not the individual; African families are optimisers, risk minimisers at best, but not maximisers. But, the question must be asked, why have we not been able to understand and accept this? Richards (1985:138) says:

> *"Part of the answer lies in the widespread acceptance of a model of cultural evolution grounded in the work of the Grand Theorists such as Spencer, Darwin and Marx. The problems faced by many African farmers were thought to be characteristic of a particular 'stage' in societal development. Science belonged to a later stage in this evolutionary process. It was difficult to believe that 'backward farmers might be in the process of working out relevant answers to their own problems, or had anything worth teaching to scientists, the front runners of 'progress'".*

It is ironic that anthropologists, not economists have come closest to explaining African economies and they have achieved this because they have spent considerable time with the communities they have studied. They have often dubbed traditional economies as 'exchange economies' or 'gift economies[2]' and words such as 'reciprocity', 'potlatch[3]' and 'obligations' often appear in their monographs. Eriksen (1995) says that, "A capitalist economy recognises only one form of commodity exchange, namely market exchange based on the laws of supply and demand; non-capitalist economies have many forms of exchange." If an important part of traditional economies are made up of exchange, then it is not surprising that western economists have problems of comprehension. In their aeroplanes the object exchanged or the gift is the object of scrutiny and valuation, whilst from the millet stalks its importance is primarily in its social and cultural function. Archetti (1991) provides us with a real life scenario: whilst buying a cup of coffee for someone in a European café and bringing it to them, they immediately gave the exact money for the drink. He says that this symbolises an unwillingness to enter into a morally committing relationship with others. Thus, if professionals[4] have lost this in their societies, how can they recognise its presence or function in others?

Two definitions of economy have been put forward by Eriksen (1995) which ring true; a system-oriented definition (capitalist) and an actor oriented definition (non-capitalist). They can be defined respectively as:

1. A systemic definition which defines the economy in relation to the production, distribution and consumption of material and non-material goods in society; and
2. an actor centered definition which defines the economy by the ways in which the actors use the available means to maximise value.

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[2] Many of the world's economies have been described as 'gift economies', that is to say the distribution of goods takes place with no fixed price (Strathern, 1988).

[3] Potlatch is derived from the Chinook American Indians and means 'to nourish' or 'to consume'. Anthropologists have adopted this word to symbolise 'gift-giving societies' (see Mauss, 1966). Anthropologists have however attributed Potlatch with antagonistic, almost aggressive, gift giving rituals, where the giver creates an oppressive bond with the receiver, forcing them to give back more than they received. This is contrary to the view expressed here. Gift giving, that forms part of a wider support network, strengthens moral bonds and obligations through the belief that it forms an effective risk minimisation strategy.

[4] Professionals is used instead of society as a whole because there is much evidence of 'moral economies' and support networks in European and American society, especially amongst the poor.

Money cannot be used to understand human agency. Mauss (1954) says traditional systems of distribution are multicentric, which is to say that economic resources were distributed according to different principles and did not form a uniform single market (as a unicentric system does, where usually the market completely dominates).

9.1.3 How can we better understand African economies?

It has predominantly been the anthropologists that have held the monopoly in understanding local African societies and economies. And consequently, it has been the anthropologists that have often spoken out on the misinterpretation and misconception by western professionals. One of the most famous anthropologists of modern times says:

> *"It is difficult to see any intellectual value in a concept of 'development' which defines it as GNP per capita. Analytically, this kind of model is unacceptably evolutionist and reductionist, since it ranks societies on an ethnocentric ladder as well as disregarding local, culturally specific value judgements"* (Mauss, 1954:17).

As the years progress, there is an increasing call in the development business for anthropologists because of the recognition that they have an empirical understanding of local economics which is vital for project success. The anthropological school has heavily influenced the revolution in investigative research methods and techniques used in development advocating more participation and longer research periods. This is a very important contribution.

Aside from the anthropologists, there is a range of other people who have increased the understanding on development and the approaches to implementing projects and programmes. These range from moral economists (e.g. Goran Hyden, James C. Scott) to political economists (Lionel Cliffe, E.P. Thompson, K. Hart, Phil O'Keefe) to rural development professionals (Robert Chambers, Ian Scoones, Piers Blaikie). Each of these disciplines has something to say on the prevailing modernisation paradigm and they are making a difference to the debate on development. Peet and Watts (1993) say that there is a need to help uncover the discourses of resistance to received wisdom, put them into a wider circulation and create networks of ideas.

The previous section has discussed the problems development professionals have had in understanding non-western modes of production. The following section examines what this means in the light of environmental management in Africa.

9.2 Local environmental management and the emerging development paradigm

The difficulty in understanding rural African modes of production has led to misinterpretations of rural resource use and perceptions of environmental degradation and improvement. Indeed, more than this, it has been the fashion to blame environmental destruction on small farmers, particularly their alleged inability to adapt to rising population pressure. When the farmer's ability to adapt is admitted, it is often regarded as insufficient (Brookfield and Padoch, 1994).

These ideas pervade the major development institutions. A good example is a World Bank report (Cleaver and Schreiber, 1992) which implies mutually reinforcing links between demographic growth, poor agricultural performance and environmental degradation. The report states that traditional land use and forest exploitation practices have become the direct causes of environmental degradation and resource depletion. To return to the problems of western thought and science, there exists the basic assumption that 'natural' phenomena exist separately from human society. This distinction does not exist in many African societies, where categories of thought are structured in very different ways and cut across a nature-culture divide (Leach and Mearns, 1996:11).

Supporting what have been called 'crises narratives' (Blaikie, 1996) are a range of institutions which reinforce the 'received' western wisdom. These include formal politics, education systems, legal arrangements and mass media and the projection of Africa in a global media which has a western slant. The latter, in particular, show preference for the negative and dramatic and consequently it is especially difficult to feature the positive within environmental reportage (Leach and Mearns, 1996). This cycle of reportage is self perpetuating, with the more crisis narratives, the more the experts and academics can lay claim to resources in order to solve them, and to peoples' lives who are involved in these crises (Blaikie, 1996:5). Almost in patriarchal form, the 'business' feeds itself.

However, what is newly emerging is a challenge to the received wisdom or orthodoxy through new people and new forms of investigation. This new trend already has been labelled into different titles, including, neo-populist or post-modern development. What is encouraging however, is that they reject the universal truths of modernism, traditional science and meta-narratives and embrace the diversity of local realities. Brookfield and Padoch (1994:8) highlight this with a practical example:

> *"The number and variety of farming systems in the world exist because farmers have, over centuries, devised them to fulfil their needs in relation to the physical, biological, social, economic and political environments that they manage. As populations have grown, declined or migrated into new regions, as new crops have become available, as environments have changed through degradation or aggradation, and as the social conditions of production have varied through time, farmers have continually adapted their methods, with greater or lesser success".*

Evidence of African success stories, and new ways of recognising lifescapes and how communities interact in them, are being brought forward with increasing frequency. A form of development is being offered or discovered which, according to Blaikie (1996):

- rejects modernisation as an inevitable and convergent direction of social change;
- respects local diversity and local agendas;
- recognises that truth is negotiable and variable;
- is aware of power relations appearing in knowledge construction, development priorities, research agendas and goal setting;
- encourages local and authentic action so that people can speak and act for themselves.

It is through an approach such as this that allows a discovery of lifescapes. Thus, just as Colombus discovered the Americas (they existed long before he ever arrived!), this thesis discovers lifescapes in Sissili, through embracing diversity, a recognition of the simultaneity and the multi-use of environments (something which current models do not accommodate). For the purpose of lifescapes it is more useful to talk about places and people rather than people and places, i.e. place-people relations are more important in determining household production patterns. The local ecology leads the household production pattern. In addition

to this, the local political system (*chefferie*), the overall economic[5] atmosphere and the local social relations all combine to create the lifescape. Another important aspect to lifescapes is their changeable natures, and there is continuity in their changing. Lifescapes have a contingency which has a temporal and locational context to it. To back up this point it is only necessary to have a brief look at west African history. Because of this complexity, it is impossible to overgeneralise about population pressure and environmental degradation in the Sahel, as has been done so often in the past.

This study has, therefore, led to an understanding of an area inhabited by a people that were the subject of a 'crisis narrative' through the idea of a lifescape that is dynamic in space and time. Modern development views did not, or could not, conceptualise the production of nature in this area where desertification should have been taking place. The worm's eye view that could see ground truths and hear the stories of the communities was gained through the employ of participatory appraisal techniques. This thesis therefore provides method for understanding rather than theory for understanding. Of course, consolidated proven method allows new theory.

9.3 Lessons learnt

A major area of learning was in the use, application and development of participatory appraisal techniques. The lifescapes as discussed above were discovered by a long and protracted contact between myself and the communities I worked with and the methodologies employed. The reconciliation of the project and the local production systems is difficult in an academic context where theoretical, i.e. generalised, conclusions are usually produced. Therefore, the emphasis in this thesis is to explore the use of participatory rural appraisal to understand the opportunities and costs of local development.

The value of using participatory appraisal techniques has been discussed and it logically follows that participatory analysis must be taught to extension staff in Africa working for rural development. Because of the financial constraints of Government, money for rural

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[5] At this juncture I am not talking about the 'penetration of capitalism' and capitalist relations. Markets in west Africa predate capitalism and entitlement exchange has happened throughout west African history through the existence of highly sophisticated non-capitalist economic systems.

development projects logically comes from NGOs that can access funds outside of the village, town and country from international donors. The levels of investment by donors and the success of the investment (i.e. in real development) will depend on the level of popular participation in the projects. Box 9.1 illustrates the different levels of participation, with the higher numbers being the most desirable. In the case of *Projet Agroforestier* there was interactive participation which led in some cases to self mobilisation.

A comment is also needed on the theoretical background of this study. In chapter two Boserup was cited as a major influence because she rightly argued that demographic change, including migration, would bring about new production opportunity. This research shows the rich texture of lifescape that is generated by such change in Sissili. Beyond that, theoretical insights were gained by addressing the peasantry as both producers, with their distinct mode of production and as consumers based on household economics. The thesis has not added substantially to that literature but it has reinforced broad conclusions from that literature which include:

I. that peasant society is not by and large integrated into a modern market system but where it can gain from such contact, it will embrace market relationships;
II. that the maintenance of the physical quality of the soil goes someway towards the maintenance of the chemical quality thus decreasing the need for external inputs. Such physical maintenance does require high labour inputs;
III. that there is a seasonality to labour demands with periods of labour shortage, especially around planting to catch positive water balance for germination;
IV. that common property resources including access to land are continually negotiated and include a recognition of the sustainability of these resources under different production systems;
V. that production and consumption cycles are intimately linked to cultural and religious themes in a calendar that reinforces the peasant production system.

These conclusions help demonstrate that at the present moment far from being an environmental disaster the sequent occupation of Sissili is a negotiated establishment of new landscapes and lifescapes dependent on local opportunity.

Box 9.1 A typology of participation

1. Passive participation
People participate by being told what is going to happen or has already happened. It is a unilateral announcement by an administration or project management without listening to people's responses. The information being shared belongs only to external professionals.

2. Participation in information giving
People participate by answering questions posed by extractive researchers using questionnaire surveys or similar approaches. People do not have the opportunity to influence proceedings, as the findings of the research are neither shared nor checked for accuracy.

3. Participation by consultation
People participate by being consulted, and external people listen to views. These external professionals define both problems and solutions, and may modify these in the light of people's responses. Such a consultative process does not concede any share in decision making, and professionals are under no obligation to take on board people's views.

4. Participation for material incentives
People participate by providing resources, for example labour, in return for food, cash or other material incentives. Much on-farm research falls in this category, as farmers provide the fields but are not involved in the experimentation or the process of learning. It is very common to see this called participation, yet people have no stake in prolonging activities when the incentives end.

5. Functional participation
People participate by forming groups to meet predetermined objectives related to the project, which can involve the development or promotion of externally initiated social organisation. Such involvement does not tend to be at early of project cycle or planning, but rather after major decisions have been made. These institutions tend to be dependent on external initiators and facilitators, but may become self-dependent.

6. Interactive participation
People participate in joint analysis, which leads to action plans and the formation of new local institutions or the strengthening of existing ones. It tends to involve interdisciplinary methodologies that seek multiple perspectives and make use of systematic and structured learning processes. These groups take control over local decisions, and so people have a stake in maintaining structures or practices.

7. Self-mobilisation
People participate by taking initiatives independent of external institutions to change systems. They develop contacts with external institutions for resources and technical advice they need, but retain control over how resources are used. Such self-initiated mobilisation and collective action may or may not challenge existing inequitable distributions of wealth and power.

Source: Pretty, 1994.

9.3.1 The impact on myself

As an Africanist, the research has meant several things. Firstly, it has clearly illustrated that Africa has its own realities and directions of growth that are clearly different from those of the west. African economies of affection, kinship networks and moralities are aspects of African societies that western societies can examine and learn from, particularly for improved environmental management. For example, marriage or initiation societies may have little advertly to do with 'environment' but nevertheless be important in understanding environmental use and management (Fairhead and Leach, 1997). The lack of understanding leads to generalisations, crises narratives, charges of corruption and ideas of inability. The fact is that Africans have their own agenda which is not ours and ways for doing things which are not our ways. If the objective is development then it must be African development for Africans rather than African development for Europeans.

As a development worker, the study has proven beyond doubt the value of participation for rural development success. The way forward in development work is through participatory appraisal techniques, prolonged contact with the target groups and in a Schumacerian sense, a localised catchment area; small is successful. The swing towards anthropology has largely been a result of the reaction against rapid rural appraisal techniques which are used for development activities instead of being limited to research. Although anthropology is useful for development because it allows an understanding of local realities, it also has its limitations. The research and development phase of the project cycle is not as long as traditional anthropological fieldwork. To discover local agendas the emphasis should be on partnership in planning, which lasts for more than a couple of weeks, as was the case in the past.

As an academic, the research has illustrated that the meta-narratives that characterise assumptions of modernisation have proved false, although this does not mean that I am a post-modernist. Instead, to understand production systems and management regimes, the unit of study must be the local and within local realities there exist a multiplicity of influencing factors which often go above and beyond the physical into the supranatural. As already has been mentioned, the generalisms of modernity need to be rejected and method,

not theory, should be used to understand environmental management regimes. In such a practical sphere as agriculture, it is of no wonder that the way one holds a hoe is more important than the concept of the hoe. This study contributes to the growing body of literature that argues similar points, both academically and practically (c.f. Chambers, 1997, Fairhead and Leach, 1996, Leach and Mearns, 1996) and also gives strength to the argument that farmers farm for improvement and produce rather than to destroy their environments.

9.3.2 The impact on the villagers

Although there has been no formal, independent evaluation of the project activities, as part of my work, myself and the villagers had periodic monitoring and evaluation sessions. The project and ADESSI were felt to bring benefits to the community groups that it worked with and it was a testament to the project's method and approach that the activities initiated by the arrival of the project still continue today[6].

The project has meant an increase in the villagers access to resources, including water, tree seedlings, tools, new skills and agricultural produce. There has also been an introduction of an increased number of options available to the farmers with them now having experience in a range of new techniques including agroforestry, horticultural and agricultural techniques. These techniques may be used in the short, medium or long term and may be used as ingredients for experimentation when the need arises. This contributes to a process highlighted by Brookfield and Padoch (1994:39), "What farmers know is important, but this knowledge changes through time, and this fact is of greater importance". Therefore, as situations change so do the necessary options available to cope with change. The more options the better. Again Brookfield and Padoch (1994:41) note, "Farmers experiment, both with recommendations offered by the authorities and new ideas and new planting materials that reach them through informal channels".

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[6] The *Projet Agroforestier* which I initiated with ADESSI now has another technical assistant after an absence of two years. ADESSI now has enlarged its village nursery programme to reach other village groups and also is starting and experimental school tree nursery programme which intends to teach and train children about how to run nurseries and the importance of trees in their local production system. This project was conceived by myself in conjunction with village groups and school teachers in the area and has recently received funding.

Through the increased range of options that were negotiated with the project and with the contact with other farmers from around the country which was made possible by the project, the farmers groups strengthened their risk minimising strategies. These strategies can also be said to have been strengthened by the institutional support and advice that was offered by the project concerning the organisational management of the tree nurseries. The village group's members' relationships with each other was strengthened and their cohesiveness was increased as a desired activity was added to their repertoire. As Fafchamps (1992) illustrates, "A mutual solidarity system can be sustained in the long run by the existence of a lasting relationship between its self-interested members.

In a short two year period, a process was initiated that created a realtionship between village groups and the NGO. This is now in the process of being strengthened and built upon through a process of trial and error on both parts.

9.3.3 The impact on development

Development theory has never got it quite right, and there has always been something missing from analyses for development. Robert Chambers and Paul Richards had located development with the farm family and understood the importance of ecology. They had the populism but they had no politics in their analysis. James Scott and Goran Hyden had the politics and family farm right but they had no ecology in their arguments. Lionel Cliffe and Phil O'Keefe had the farm family and the ecology right but their meta-theory was too big to explain the local management of natural resources. What this study has to say about development theory is that to understand and improve on the local management of natural resources, there has to be an appreciation of the local and regional history and ecology, an understanding of the local politics and a focus on the farm family as the agent of development and the institution to be supported. Lives and landscapes are complex entities which need a holistic approach if they are to be understood, this means taking each situation as unique and putting it in the context of the issues mentioned above.

Two things can be said about the evolving farming systems in the villages; firstly, is the increasing use of the plough over the hoe (although hoe cultivation will never be completely

replaced, especially for tuber cultivation); and secondly, the reduction in the fallow period. Boserup (1972) in her analyses says two things in relation to this. Firstly, she says, that the carrying capacity of a certain area is significantly increased through the change from hoe cultivation with long fallow to short cultivation with animal draught power. Secondly, she says intensive systems of bush-fallow, with up to eight years of uninterrupted cultivation, followed by a similar period of fallow, have a larger carrying capacity for human populations than short fallow with ploughing by animals. In relation to the three villages, this analysis provides some useful pointers to possible future developments. In practical terms, the carrying capacity of Sissili has dramatically increased, which is demonstrated by the fact that significantly more people live in the province with no apparent negative effects, and there is an increasingly high incidence of ploughed farming throughout the province. However, whilst ploughed farming is prevalent, it is by no means used by all farmers. What becomes evident among the two sedentary ethnic groups is that the Nuni are intensifying their production system, testified to by Boserup's latter point, and the Mossi remain extensive farmers but with the introduction to their system of a new range of possibilities. Although unwilling farmers, the Fulani are the most intensive cultivators and have the highest yields of all the groups, cultivating on the sites of old cattle corrals. The results of the study are pro-Boserup, not Malthus.

Above all, the conclusions to the thesis emphasise that farmers produce nature and do not willingly destroy it and to understand African economies and to achieve development there must be a willingness to remove the shackles of western scientific thought and enter into a relationship with Africans for sustainable development.

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APPENDICES

APPENDIX 1. GLOSSARY OF TERMS

Al Haji	One who has visited Mecca.
Burkinabé	A person from Burkina Faso.
Bush field	Fields as far as 10 km away form the compound, but are usually much nearer (normally from 1.5 to 4 km from the house). Here staple crops are cropped on large land parcels, fertiliser is rarely added, instead fallowing is relied upon for improving soil fertility.
Buttage	The act of making small mounds of earth around each plant, to support the plant against wind and also as a soil and water conservation technique (also prevents water logging of the plant).
Caisse	French word for central fund or kitty
Calabasse	A hollowed gourd used as a container or bowl (also spelt calabash)
Canton	A neighbourhood in a village (*quartiér* in French)
Cola nuts	Cola nuts come from the Cola tree (*Cola nitida*). They have been used in West Africa for centuries as a stimulant. It is an ingredient in Coca Cola.
Daba	A hoe, the main agricultural implement.
Diguette	An erosion control measure in farmers' fields made of stone lines that follow the field's contours.
Dolo	A local beer brewed by women that is made from fermented red sorghum, the brewing of dolo is associated with pig production because the fermented sorghum is used to fatten swine that usually seen around 'cabarets' or dolo bars.
Fetish	An object believed to procure for its owner the services of a spirit lodged within it[1] The object can be stone, wood or an amalgamation of blood, bone and feathers.
Foutou	A staple food carbohydrate, made from yam, in a heavy dough, primarily a staple of the Nuni.
Fulfulbé	The language of the Fulani
Guedwa	Household or village fields
Guédwi	Household fields
Household field	Fields adjacent or in close proximity to the compound where high value crops are grown requiring relatively high inputs such as fertiliser, labour and sometimes water.
Kapokiér	The calyx of the kapok tree or *kapokiér* (*B.costatum*) are used as a sauce ingredient.
Karé	Bush fields
Kombéré	The Mossi word for a canton leader.
Lembgha	The Mossi word for the customary 'taste before buying' of the local beer, dolo.
Mobilette	A French made scooter which is the most popular form of transport in Burkina Faso.
Mooré	The language of the Mossi
Fulani	Fulani

[1] Chambers Concise Dictionary, 1993.

Pio	The village chief (chef de village)
Sakse	A Mossi quarter or canton
Sixiéme (6iéme) FED (Fonds Européen de Développement)	The sixth phase of investment by the European development fund in the province of Sissili. The total budget for 1993/1995 was 11 billion FCFA. Project support included a *gestion de terroirs* programme, a water project (wells and boreholes), and support for the local ministries.
Temps de soudoure, Hungry period or season.	A period from the second half of the dry season to the middle of the wet season (May to September), when the stored grain has finished and the harvest is not yet in. This is a very difficult time, high in mortalities and illness, because of the weakness brought on by hunger. Often wild foods supplement the diet at this time.
Tenga	The Mossi word for the land or the land spirit.
Tengnaaba	The Mossi word for the village chief.
Tia	The Nuni word for land or 'land spirit' hence *Tiatiu*
Tiatiu	The land chief (chef de terre)
To (pronounced toe)	The staple food carbohydrate, made from millet, maize or sorghum in the form of a heavy dough (the west African equivalent of the east African Ugali or the southern African Sadza).
Village field	Fields located in the spaces between compounds in the village and are used for staple foods, which require larger surface areas. There are inputs of fertiliser and labour.
Wac	An expression (northern Ghana) for a powerful Animist fetish aimed at killing or cursing.
Wendé	The God of the Mossi.
Wild grapes	From *L.microcarpa*
Zaka (s) Zakse (plural)	A Mossi compound

APPENDIX 2. LAND CLASSIFICATION UNITS ACCORDING TO DE BOER, 1992

The following classification has been translated from de Boer (1992) who has based his system on studies by Sow and Zombre (1989) and Egging (1990).

S - Low density woody savanna on rocky outcrops

This unit represents rocky outcrops, where one finds granite outcrops and a gravelly surface soil cover. Common features are plateaus with attached cliffs with bare soils and rock outcrops. The soils are very shallow and extremely fragile. Vegetation is made up of small trees and bushes: *C.glutinosum*, *D.microcarpum*, *B.africana*, *S.tormentosa*, *Stryclinos spinosa*. Tree density is taken at 15-20 trees per hectare and 50-60 bushes/ha. Average tree height is 12-15 m and 0.5-3 m for bushes. The dominant plant species are *Microcloa indica* and *Loudetia togoensis*. There are few perennial grasses present. This land class is rarely farmed.

D - Low density woody savanna

This unit is found in the same general area as unit S but has less rocky outcrops. It is often found on the tops of hills with shallow and gravelly soils with the hard laterite layer found deeper here than in unit S. There are no cliffs present. The low density vegetation is characterised by *D.microcarpum*, *C.glutinosum*, *B.africana* and *L.acida*. Tree and bush density is 15-35/ha and 50-80/ha respectively, with heights of 12-15 m and 1-3 m. There are low density grasses, *Andropogon ascinodidis* and *Schyzachyrium domingense* being the most important. This land class is also rarely farmed.

A - Dense woody savanna

This undulating land form is found on the edges of the province on the slopes. The soils are sandy gravel with some agricultural potential. There is a rich vegetation cover with a high pasture potential. Trees include: *I.doka*, *D.olivera*, *P.biglobosa*, *V.paradoxa*, *B.parkii* and *Gardenia spp*. One finds 25-60 trees/ha, ranging from 12-15 m in height. Bushes number

greater than 100 per hectare and are 1-3 m high. Perennial grass cover, predominantly of *A.ascinodis* is good in terms of quality and percentage area cover.

Sb - Bush savanna

The bush savanna covers a large area and is easily recognisable on aerial photos by its spread, regular texture and grey colour. The soils are sandy-limonitic with some gravel and are more fertile than the previous units. It is found on the lower slopes, often in depressions or near to valley bottoms, and has a high agricultural potential. These areas are coming under pressure from agricultural expansion and are disappearing in areas of widespread farming. There is a inverse relationship between bush savanna and the area of the cultivated surface. Dominant species include: *V.paradoxa*, *B. parkii*, *C.glutinosum*, *Gardenia spp* and *P.biglobosa*. Tree density is 20-50 trees/ha at heights of 13-16 m, there are more than 100 bushes/ha with heights from 0.5-2 m. Perennial grasses cover approximately 10 percent of surface area and include *Andropogonae* and *S.domingense*.

B - Forested savanna

This vegetation class is found on the sides of hills with an undulating relief pattern and sandy-limestone soils. Trees include: *P.biglobosa*, *P.thonningii*, *D.glomerata* and *B.parkii*. There are 30-50 trees/ha at 13-16 m. There are 30-40 bushes/ha at heights of between 1 and 3 m. The dominant perennial grass is *A.ascinodis*.

C - Fields or fallows on slopes

These are the areas where agriculture is concentrated and are found throughout the province on slopes, depressions and often near valley bottoms. The soils are sandy-limestone with no gravel. Cereal production dominates the farming system, mostly sorghum and millet. Trees include *V.paradoxa*, *P.biglobosa* and *B.parkii*. There are many annual grasses, such as *Eragrostis aspera*, *Schyzachirium exile* and *Eragrostis tremula*. Because of the regenerative characteristics over time there are no data available on tree height or density.

R - Low density riparian forest

These are found throughout the province in the valley bottoms and along drainage routes. Relief is flat or undulating. Soils contain more limonite and detrific sedementry rock (fertile)

- texture is limonitic-argillic. Tree species include *K.senegalensis*, *P.thonningii* and *Ficus spp.* There are 10-30 trees/ha with heights of 13-17 m. Bush density is 60-80/ha at 2-5 m. The dominant perennial grass is *A.gayanus*.

F - Dense riparian forest

These are dense forested areas which include gallery forests which are concentrated along the principal drainage routes and the main rivers in Sissili. The soils are heavier compared to low density riparian forests with an argillic-limonitic texture. Species include *K.senegalensis*, *D.olivera*, *M. inermis*, *A.leiocarpus* and *Palmae spp*. There are 70-80 trees/ha at 15-20 m. Bushes have a density of 15-20 per hectare.

P - Humid prairie or swamp

This unit is found in drainage zones which are prone to flooding. They contain heavy, argillic soils and have no trees. Plants include *E.stagina*, *Hyparrhenia rufa*, *Panicum spp* and *C.obtusifolia*. The high herbaceous cover gives this unit high pasture potential.

b - Fields or fallows in valley bottoms

There are limonitic and argillic soils. This area is often used for rice production.

N - Bare soil

The bare soils are found in small land parcels, on hilltops near rock outcrops.

The table overpage gives a summary of the information in the classification system.

Table A1. Characteristics of land classification units as described by de Boer (1992)

UNIT	DESCRIPTION	SOILS	WOODY BIOMASS	A	B	HERBACEOUS SPP	C
S Low density woody savanna on rocky outcrops	rocky outcrop with cliffs	lateritic or granite crust with rocky outcrop	*C.glutinosum.* *D.microcarpum* *B.africana*	15-20	50-60	*L.togoensis.* *A.ascinodis.* *M.indica.*	0.9
D Low density woody savanna	hilltops	gravel, granite	*D.microcarpum.* *C.glutinosum.* *B.africana* *L.acida*	15-35	50-80	*A.ascinodis* *Cochlospernum sp.* *S.domingense* *M.indica*	7.0
H Hilltop fields or fallows	hilltops	sandy	Crops *V.paradoxa*			Crops (millet, groundnut)	
A Dense woody savanna	undulating higher slopes	sandy-gravel	*I.doka.* *D.olivera* *V.paradoxa* *Gardenia spp.* *B.parkii*	25-60	100 +	*A.ascinodis.*	10
Sb Bush savanna	undulating bottom slopes	gravel, sandy limonite	*V.paradoxa* *P.biglobosa.* *Terminalia spp.* *B.parkii*	20-50	150 +	*A.gayanus.* *A.ascinodis.* *S.domingense*	10
B Forest savanna	undulating	sandy-limonite	*V.paradoxa* *P.biglobosa* *B.parkii* *P. thonningii.* *D.glomerata*	30-50	30-40	*A.ascinodis.*	0-10
C Fields or fallows on slopes	undulating	sandy-limonite	Crops *V.paradoxa*			Crops (sorghum, millet, maize)	
R Low density riparian forest	Flat, undulating	alluvial, limonite-argillic	*K.senegalensis.* *A.sieberiana.* *P. thonningii* *Ficus spp.*	10-30	60-80	*Sporobulus spp.* *A.gayanus.*	6.5
F Dense riparian forest	flat	alluvial, argillic	*K.senegalensis.* *Palmae spp* *D.olivera* *M.inermis.* *A.leiocarpus*	70-80	30-40	*A.gayanus.*	6.5
P Humid prairie or swamp	flat	alluvial, argillic				*Echinochloa sp.* *Hyparrhenia sp.* *Panicum spp.* *C.obtusifolia*	>10
b Field or fallow in valley bottom	flat	alluvial limonitic to argillic	crops			crops (rice)	
N Bare soil	undulating to flat	varied					

Key to Table A1. A: trees per hectare; B: bushes per hectare; C: percentage cover by perennial grasses
Source: adapted from: Sow & Zombre 1989, Egging 1990, de Boer 1992.